

# SURFACE-WATER RESOURCES

By M. E. Garling\*

## GENERAL

As a consequence of its highly irregular configuration the Kitsap Peninsula is drained by hundreds of small stream systems. Only 12 streams in the area have surface drainage areas that exceed 10 square miles and most are less than 1 square mile. Because much of the region lies in the rain shadow of the Olympic Mountains, mean annual precipitation in this area is generally lower than that received in most other parts of western Washington. This combination of small drainage basins and low precipitation, in most cases, makes it exceedingly difficult and costly to concentrate and develop appreciable quantities of surface water. Nevertheless, many of the streams do produce a sufficient continuous supply to maintain the household needs of riparian owners. For this reason and because of the great residential attractiveness of the area, it appears that the majority of future surface-water developments will be concerned primarily with small quantities of water for domestic supplies. An effort was therefore made in the following sections to inventory and summarize all available data on surface waters and to analyze all streams in the report area regardless of size or apparent importance.

## STREAMFLOW CHARACTERISTICS

### SHORT-TERM VARIATIONS

Areal distribution and occurrence of precipitation, and geohydrologic characteristics of each watershed are the two most influential factors controlling daily and seasonal streamflow variations in the Kitsap Peninsular region. Nearly all the streams follow a seasonal pattern of high flows in winter and low flows in summer with transition periods in the spring and fall. This is clearly illustrated in figures 32, 36, 40, 44, 48, 52, 56, 60, 64, 68, and 72 which show, by means of bar graphs, the monthly range in flows that have occurred in several streams within the report area. The larger, short-duration fluctuations in streamflow which usually occur over a period of days, almost without exception, are the result of direct runoff immediately following storms. Figures 25, 26, 27, and 28 are selected streamflow hydrographs of some of the larger streams in the report area, and they show that peak discharges usually occur during the months of November through March. After each peak discharge recedes, subsurface storm runoff and ground-water runoff become the major contributors to streamflow. The ground-water runoff maintains a base flow in streams during the usual precipitation-deficient summer period with the magnitude of its contribution being directly related to water storage and transmission characteristics of aquifers within and around each basin.

The complex glacial materials found underlying most of this area makes it difficult to determine the exact location and extent of aquifers, but there is definite evidence that many are continuous beneath several drainage basins. In some cases the direction of ground water movement is independent of surface topography, and under such conditions, some of the precipitation received in one watershed could be transferred as ground water in the aquifers to adjacent or nearby basins. If stream channels in the adjacent or nearby basins intercept such water-bearing materials, some of the water will eventually be discharged into their systems. This transfer of ground water from one basin to another obviously occurs in many perimeter areas along the shores of the Kitsap Peninsula and nearby islands where small spring-fed streams often produce more annual runoff than could be collected from precipitation within their own topographic basin boundaries. Large contributions of ground water have the effect of producing a relatively constant flow throughout the year below the area where discharge from the aquifer occurs. Upstream from the areas where ground water is discharged, smaller streams generally become dry after direct storm runoff has drained from the watershed. Also, certain streams will become completely dry at times if there is insufficient ground water in storage to maintain perennial flows.

Natural storage provided by many lakes and marshes located throughout the Kitsap Peninsula also helps to maintain streamflow during the summer drought period (table 50). Sizeable quantities of runoff water are retained in these reservoirs and slowly released to outlet streams. Although some precipitation is received as snow during the winter months, storage in this form is short-lived and does not have any appreciable regulatory effect on streamflow.

### LONG-TERM VARIATIONS

Since there was no continuous-record stream gaging in the report area prior to 1945, long-term annual streamflow variations are somewhat uncertain. The longest streamflow record available for estimating past long-term trends is provided by the Gold Creek gage located about eight miles west of Bremerton. This gage has been in continuous operation since 1946 and correlation studies of annual discharge among all major gages show that Gold Creek is highly representative

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\*Author of SURFACE-WATER RESOURCES section except for parts entitled BASIC STREAMFLOW DATA and FLOODS IN THE REPORT AREA which were submitted by the Surface-Water Branch of the U. S. Geological Survey, Tacoma, Washington; Earl G. Bailey, Hydraulic Engineer, author.

Figure 25. STREAMFLOW HYDROGRAPHS OF MISSION AND GOLD CREEKS.

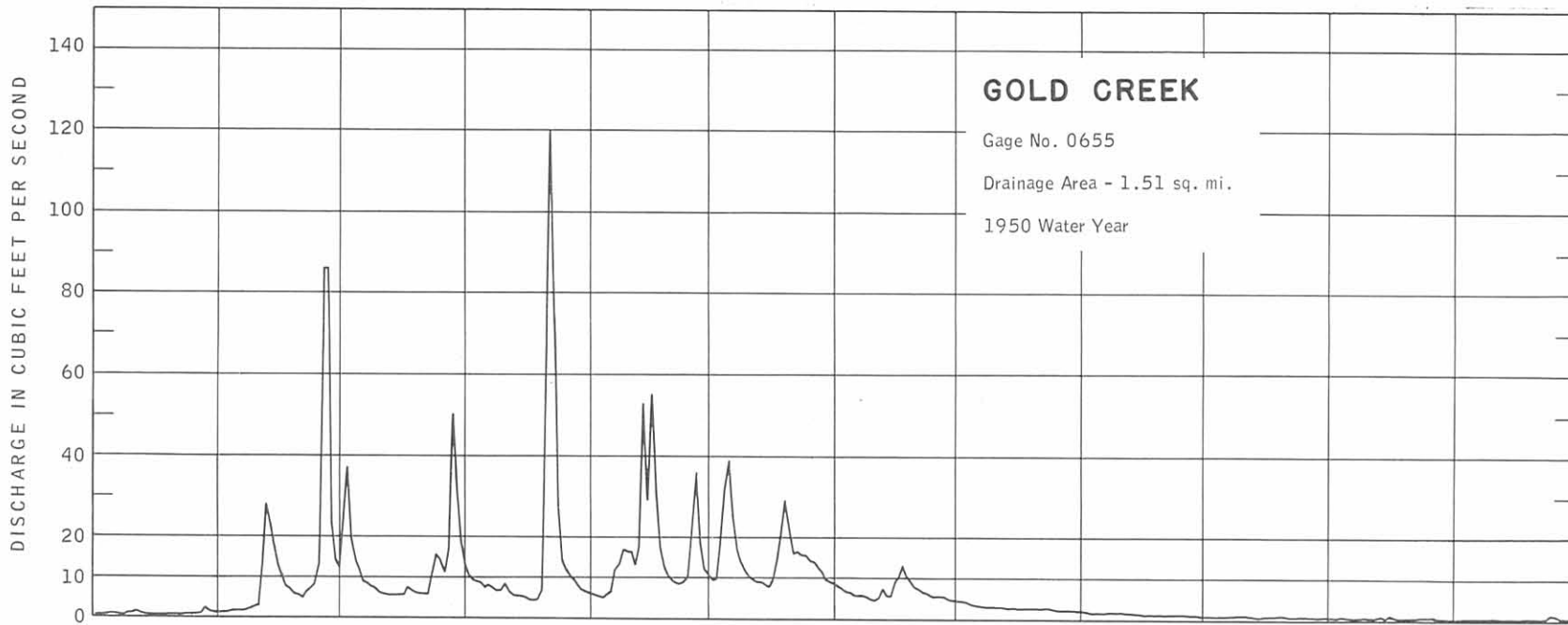
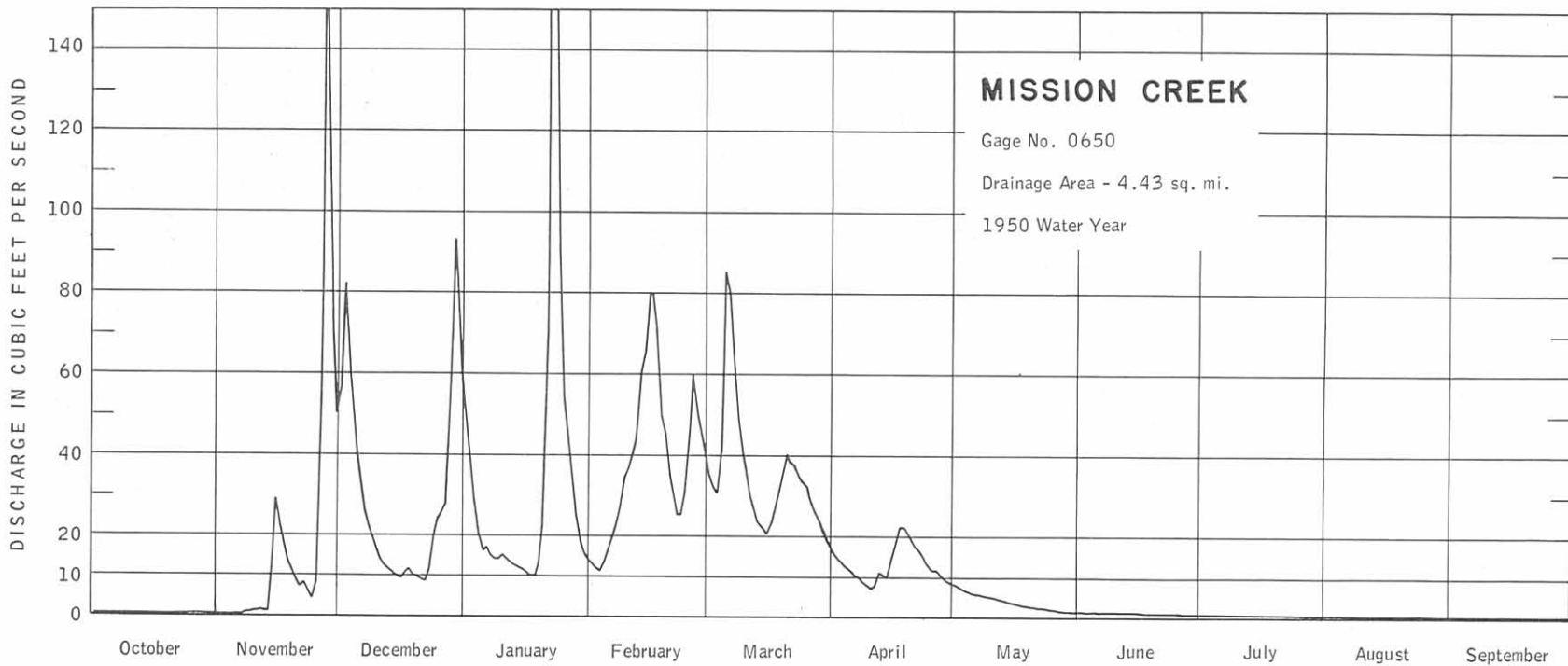


Figure 26. STREAMFLOW HYDROGRAPHS OF TAHUYA RIVER AND DEWATTO CREEK.

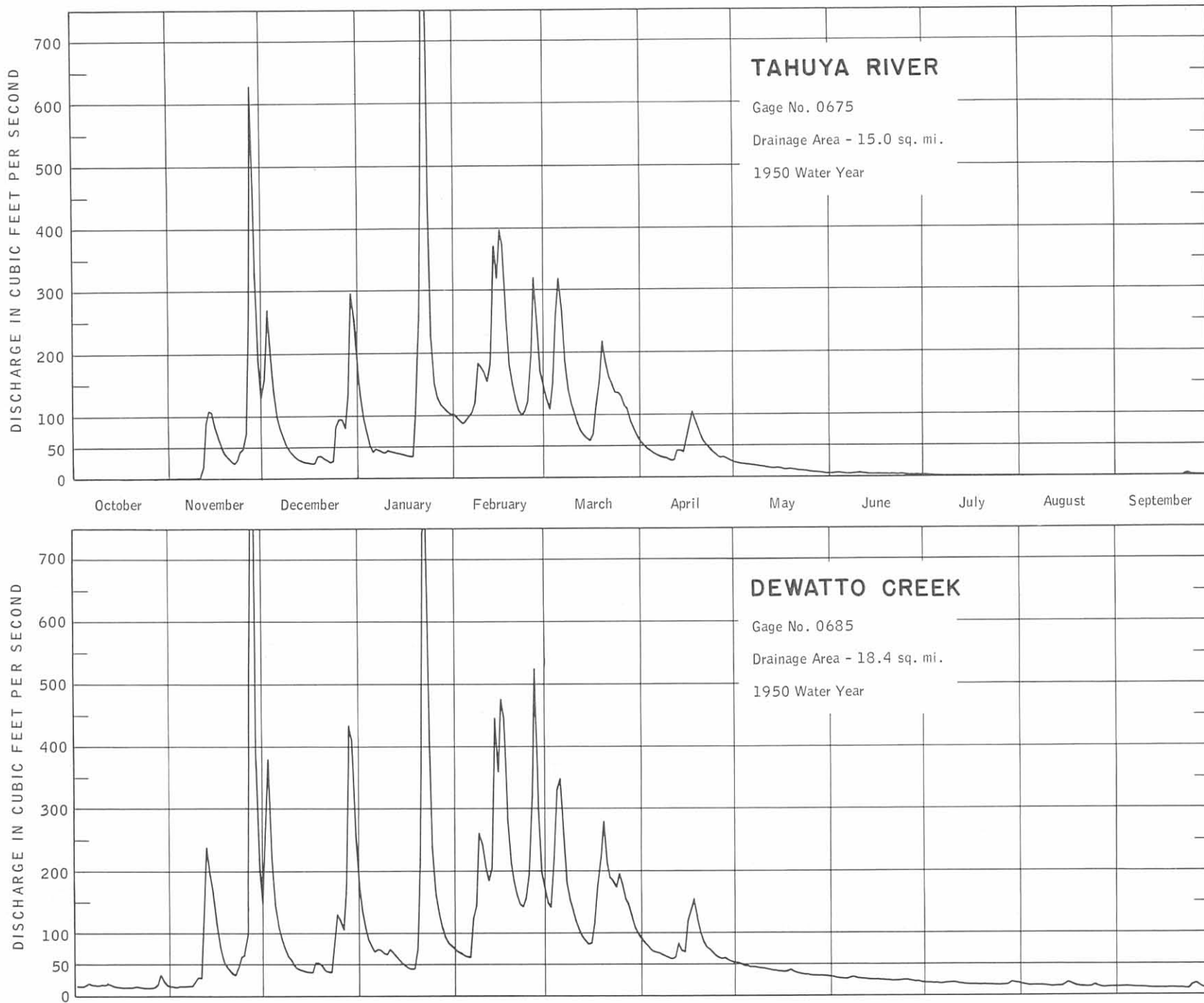


Figure 27. STREAMFLOW HYDROGRAPHS OF DOGFISH AND CHICO CREEKS.

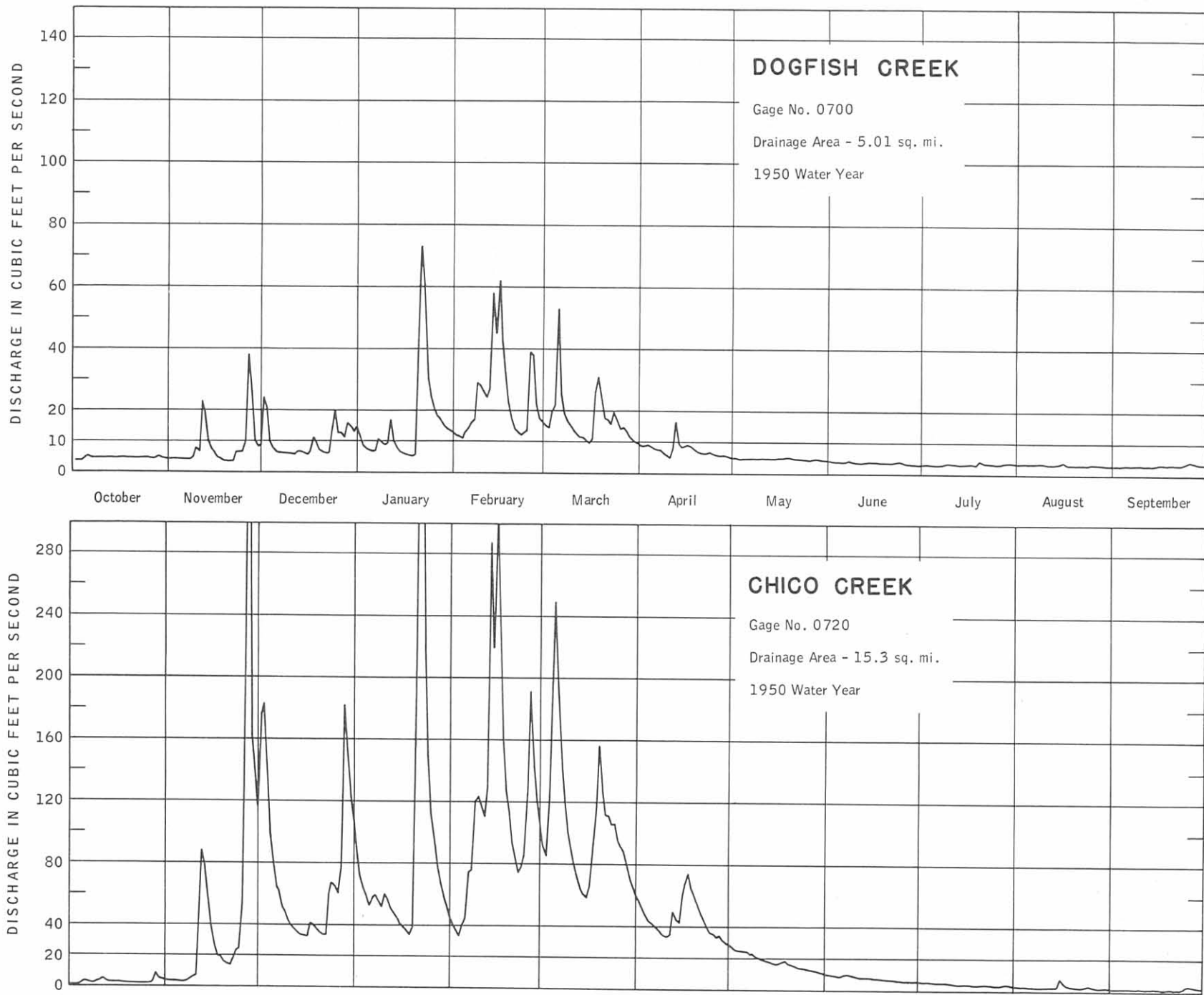




Figure 28. STREAMFLOW HYDROGRAPHS OF BLACKJACK AND BURLEY CREEKS.

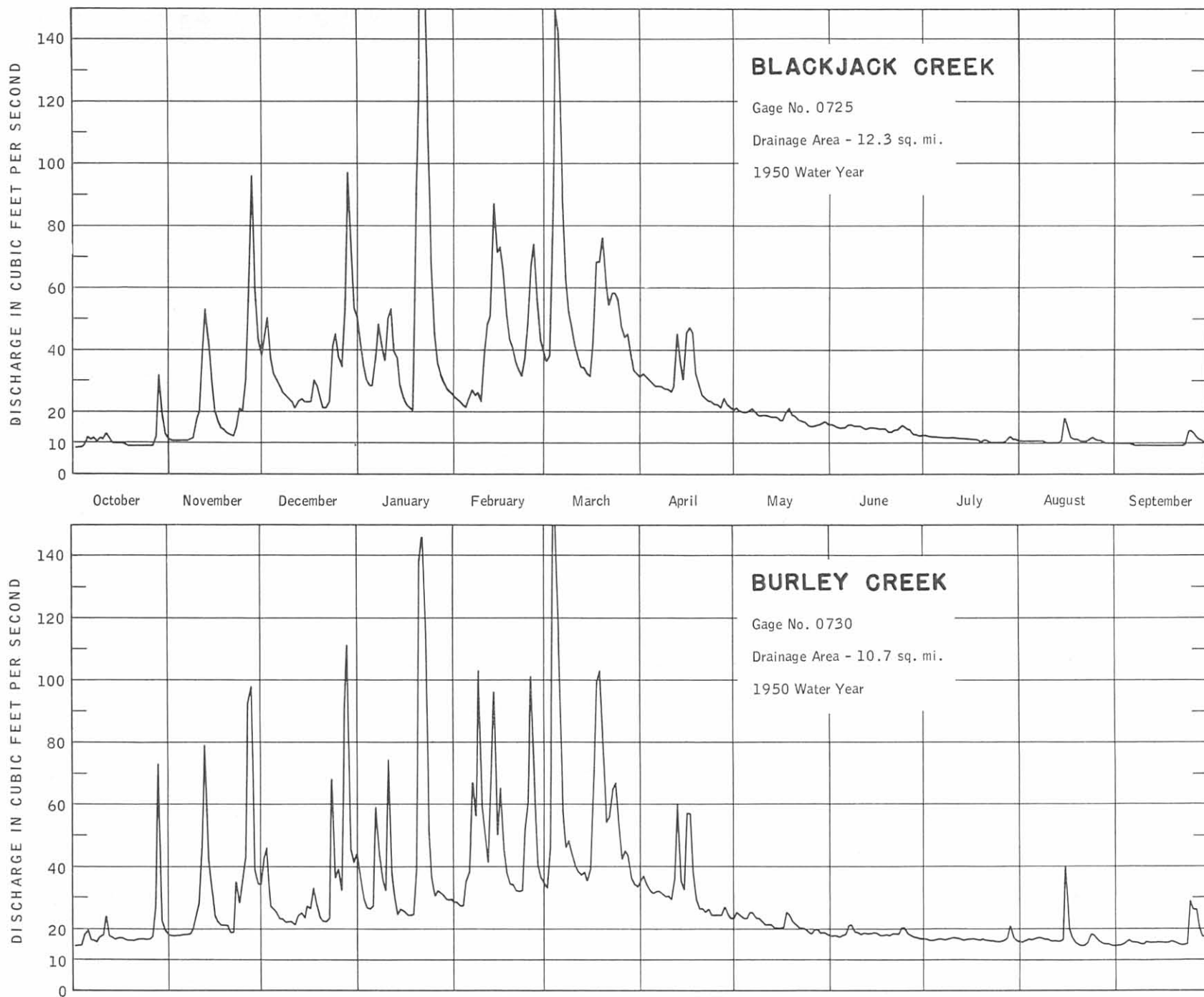
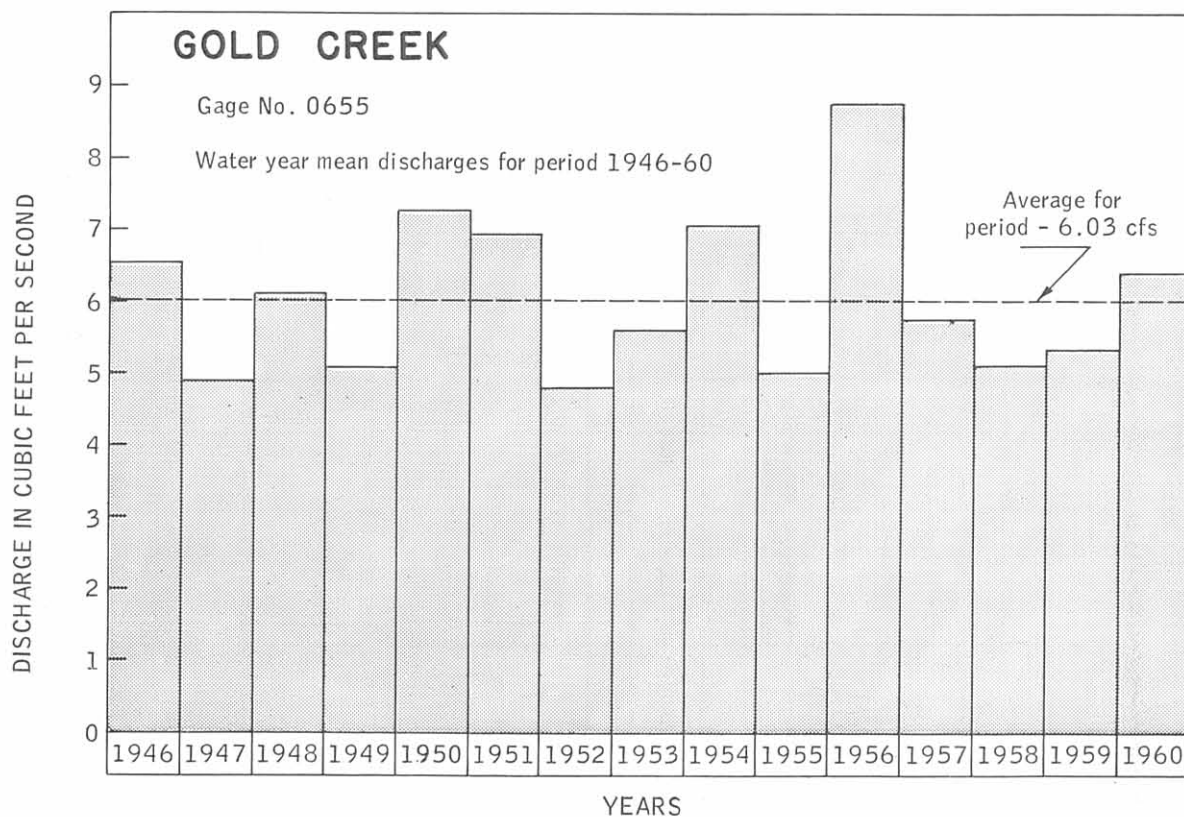


Figure 29. WATER-YEAR MEAN DISCHARGES FOR GOLD CREEK



of general trends throughout the area. A graphic representation of this record is, therefore, presented in figure 29 as a relative indicator of conditions during the period 1946-60. Individual statistics showing the variability of annual runoff for this drainage basin and others in the area are listed in table 49. Insight on annual streamflow trends prior to 1946 can be gained through use of synthetic annual runoff ratios explained on page 109.

#### BASIC STREAMFLOW DATA

By E. G. Bailey, U.S. Geological Survey

Basic streamflow data consist of records of streamflow collected at gaging stations and the results of discharge measurements made at other sites. The streamflow data collected at gaging stations usually are published as records of daily discharge in cubic feet per second (cfs); as monthly discharge in cubic feet per second and in acre-feet; and as yearly discharge in acre-feet. In addition, where the flow at a station is not appreciably affected by upstream regulation or diversion, monthly and yearly discharge figures are also given in cubic feet per second per square mile and as depth in inches for the drainage basin. Discharge measurements made at sites other than gaging stations are made by current meter or by indirect methods that utilize the slope of the channel as indicated by high-water marks, and data on the size, shape, and roughness of channels or of bridge and culvert openings.

Streamflow data have been collected at 18 gaging stations in the Kitsap Peninsula area, several of which have only short periods of record. The short-term records are from gaging stations operated during low-flow summer seasons in

conjunction with a series of measurements made to inventory the low flows of streams in the area. Five years or more of continuous discharge records were collected at 11 of the gaging stations. Streamflow data for all the stations are summarized in this report. In addition, records of discharge for the stations that have been in continuous operation for 5 years or more are analyzed and presented in several ways as described in the following pages.

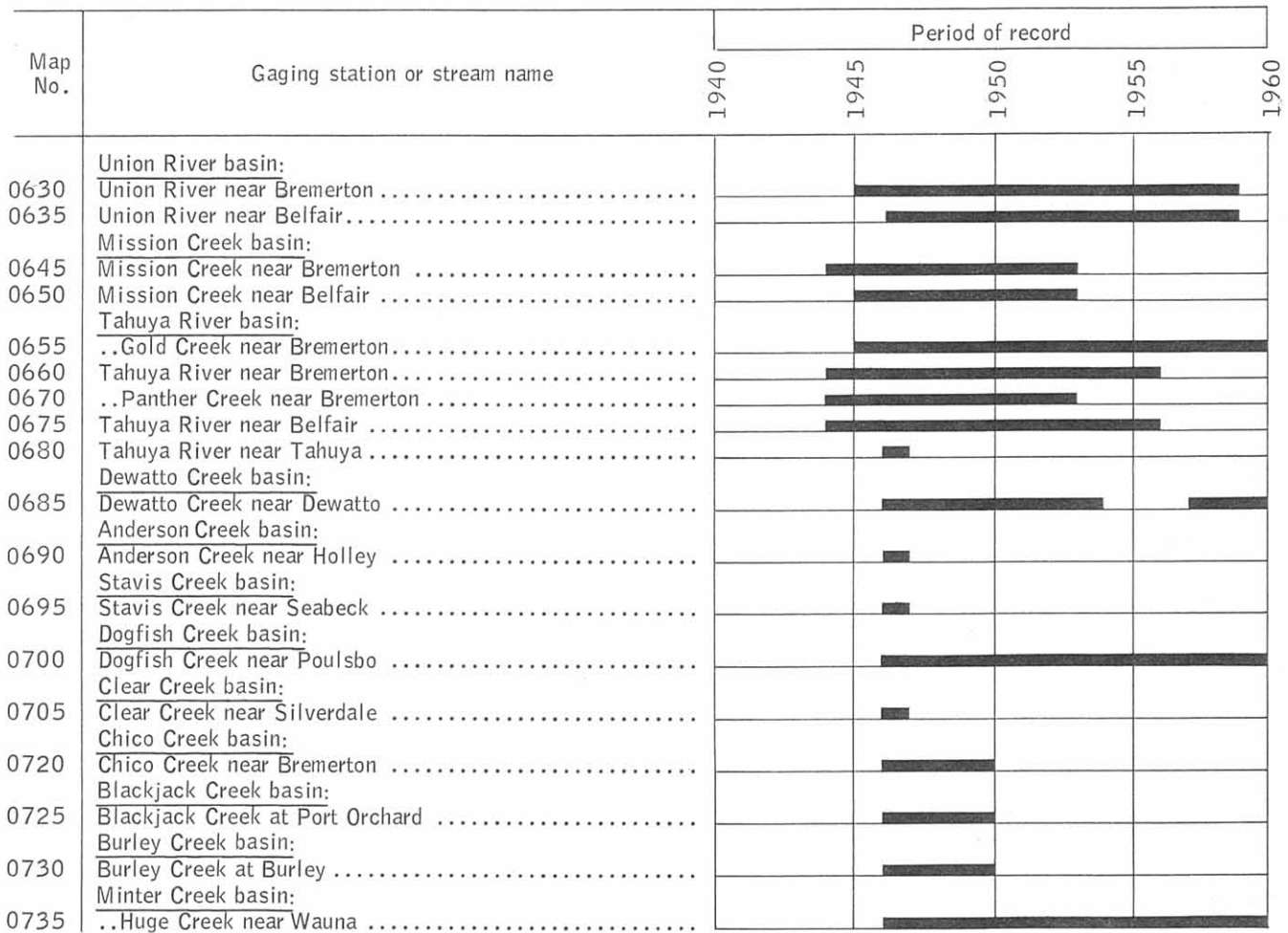
#### BAR CHART OF GAGING STATION RECORDS

All gaging stations that have been operated in the report area are listed in the bar chart on page 57, which shows the years during which each station was operated. The streams are listed in clockwise order around the Kitsap Peninsula. The stations on each stream are listed in downstream order where two or more stations are located on one stream. Stations on a tributary that enter above a main-stem station are listed before that station. If a tributary enters between two main-stem stations, the tributary station is listed between them. Tributary streams are indicated by indentation. Each station has been assigned a number that can be used to locate the station on the surface-water map (pl. 3).

#### SUMMARY OF DATA

Basic data that have been collected at gaging stations and at miscellaneous discharge measurement points in the report area are summarized in tables 10 and 11. More detailed data for each station will generally be found in water-supply papers published by the U.S. Geological Survey or in bulletins published by the State of Washington.

Figure 30. BAR CHART OF GAGING STATION RECORDS.



The data presented in table 10 are, for the most part, self-explanatory; only those items that may need further explanation are described here. The stations in the table are listed in downstream order as described under "Bar chart of gaging station records." The elevation shown for each gaging station is the approximate elevation of the bed of the stream above mean sea level. Discharge data are presented on both annual and seasonal bases. Maximum discharge figures are omitted from the extremes columns for records of less than one full year. Maximum and minimum discharge figures are for the period of record indicated at each station.

Table 11 lists selected miscellaneous measurements of discharge at points other than stream-gaging stations. The discharge listed therein is the minimum discharge that has been measured at each site; it is not necessarily the minimum discharge that has occurred in the past or that can be expected to occur in the future. In almost every case, however, each discharge listed approximates the minimum flow at that point during the low-water season in which the measurement was made. When evaluated, such measurements are helpful in appraising the overall water supply and in determining the potential low flow at the places where they were made. At some sites, several measurements have been made in addition to those reported herein; the results of these additional measurements are contained in the U.S. Geological Survey water-supply papers (WSP) listed in the column headed "Publication."

#### REGIMEN OF FLOW

The basic streamflow data from 11 of the stations listed in table 10 are summarized and presented in this section to demonstrate the streamflow characteristics and to provide a basis for further study. These gaging stations, each of which has 5 years or more of continuous record, are listed below.

Map No.	Gaging station
0630	Union River near Bremerton
0635	Union River near Belfair
0645	Mission Creek near Bremerton
0650	Mission Creek near Belfair
0655	Gold Creek near Bremerton
0660	Tahuya River near Bremerton
0670	Panther Creek near Bremerton
0675	Tahuya River near Belfair
0685	Dewatto Creek near Dewatto
0700	Dogfish Creek near Poulsbo
0735	Huge Creek near Wauna

The data thus summarized are expressed in terms of (1) maximum and minimum daily discharge, (2) maximum, minimum, and average monthly discharge, and (3) duration of

Table 10. SUMMARY OF GAGING STATION STREAMFLOW RECORDS.

Sta. No.	Name	Location	Drain. area (sq mi)	Elev. ft above m.s.l.)	Period of record	Annual discharge (water year ending Sep-			
						Maximum		Minimum	
						Acre-feet	Year	Acre-feet	Year
0630	Union River near Bremerton	SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 34, T. 24 N., R. 1 W., 1 mile downstream from Casad Dam, 1 $\frac{1}{4}$ miles upstream from Hazel Creek.	3.18	395	1945-59	12,420	1956	6,590	1958
0635	Union River near Belfair	NE $\frac{1}{4}$ sec. 20, T. 23 N., R. 1 W., 2 miles upstream from mouth and 6 miles downstream from Casad Dam.	19.8	45.6	1947-59	54,880	1956	30,940	1958
0645	Mission Creek near Bremerton	NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 32, T. 24 N., R. 1 W., on west shore of Mission Lake, 300 ft upstream from lake outlet.	1.83	513.0	1945-53	6,080	1951	3,420	1947
0650	Mission Creek near Belfair	NW $\frac{1}{4}$ sec. 18, T. 23 N., R. 1 W., 5 miles upstream from mouth.	4.43	330.0	1945-53	11,930	1951	6,160	1947
0655	Gold Creek near Bremerton	NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 21, T. 24 N., R. 1 W., 1 $\frac{1}{4}$ miles upstream from mouth.	1.51	750.9	1945	6,350	1956	3,480	1952
0660	Tahuya River near Bremerton	SE $\frac{1}{4}$ sec. 19, T. 24 N., R. 1 W., 1 $\frac{1}{2}$ miles downstream from Tahuya Lake.	5.99	540	1945-56	22,700	1956	11,600	1955
0670	Panther Creek near Bremerton	NW $\frac{1}{4}$ sec. 31, T. 24 N., R. 1 W., half a mile downstream from Panther Lake.	0.98	486	1945-53	2,650	1951	1,760	1947
0675	Tahuya River near Belfair	SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 10, T. 23 N., R. 2 W., 3 $\frac{1}{2}$ miles downstream from Panther Creek.	15.0	353	1945-56	50,410	1956	24,190	1947
0680	Tahuya River near Tahuya	SW $\frac{1}{4}$ sec. 12, T. 22 N., R. 3 W., 2 $\frac{1}{2}$ miles upstream from mouth.	42.2	60	1947	-	-	-	-
0685	Dewatto Creek near Dewatto	Sec. 23, T. 23 N., R. 3 W., at county road bridge, 1 $\frac{1}{2}$ miles upstream from mouth.	18.4	55	1947-54, 1958-	58,330	1950	27,600	1951
0690	Anderson Creek near Holley	S $\frac{1}{2}$ sec. 17, T. 24 N., R. 2 W., half a mile upstream from mouth.	5.17	20	1947	-	-	-	-
0695	Stavis Creek near Seabeck	SW $\frac{1}{4}$ sec. 25, T. 25 N., R. 2 W., three-quarters of a mile upstream from mouth.	5.87	15	1947	-	-	-	-
0700	Dogfish Creek near Poulsbo	SW $\frac{1}{4}$ sec. 11, T. 26 N., R. 1 E., half a mile upstream from mouth.	5.01	20	1947	8,960	1956	5,030	1955
0705	Clear Creek near Silverdale	At north line sec. 16, T. 25 N., R. 1 E., 75 ft downstream from highway crossing, 1 mile upstream from mouth.	7.46	30	1947	-	-	-	-
0720	Chico Creek near Bremerton	At north line sec. 8, T. 24 N., R. 1 E., half a mile downstream from Dickerson Creek.	15.3	50	1947-50	-	-	-	-
0725	Blackjack Creek at Port Orchard	SE $\frac{1}{4}$ sec. 26, T. 24 N., R. 1 E., a third of a mile upstream from mouth.	12.3	30	1947-50	-	-	-	-
0730	Burley Creek at Burley	NE $\frac{1}{4}$ sec. 11, T. 22 N., R. 1 E., at county road bridge a quarter of a mile upstream from mouth.	10.7	10	1947-50	-	-	-	-
0735	Huge Creek near Wauna	At north line sec. 20, T. 22 N., R. 1 E., an eighth of a mile upstream from mouth.	6.47	100	1947	12,550	1956	5,770	1952

tember 30)	Seasonal discharge (July to September)					Extremes of Discharge			
Mean	Maximum		Minimum		Mean	Maximum (cfs)	Date	Minimum (cfs)	Date
Acre-feet	Acre-feet	Year	Acre-feet	Year	Acre-feet				
8,840 (14 years)	2,520	1957	105	1951	602 (14 seasons)	476	Feb. 22, 1949	0.2	June 2, 1955
39,620 (12 years)	4,430	1951	3,090	1952	5,730 (13 seasons)	1,610	Feb. 22, 1949	11	Aug. 15, 1959
4,800 (8 years)	99	1948	0	1951	25.4 (9 seasons)	96	Feb. 22, 1949	0	Many times
8,970 (7 years)	126	1948	44	1947	79.2 (7 seasons)	403	Feb. 22, 1949	0	Sept. 16, 21, 22, Oct. 1, 1951
4,370 (15 years)	206	1948	88	1952	143 (15 seasons)	203	Feb. 22, 1949	0.1	July 29, Sept. 9, 1958
16,170 (11 years)	399	1955	73	1950	209 (12 seasons)	504	Nov. 3, 1955	0.1	Sept. 22-26, 1947, Sept. 1- 10, 12, 13, 1949, Oct. 4- 10, 1952
2,170 (8 years)	21.4	1946	0	1945- 1953	3.56 (9 seasons)	88	Feb. 22, 1949	0	Many times
35,090 (11 years)	261	1948	4.8	1951	115 (12 seasons)	1,210	Nov. 3, 1955	0	Many times
-	-	-	-	-	1,770 (1 season)	-	-	6.9	Sept. 2, 3, 1947
47,140 (9 years)	3,690	1948	2,570	1947	2,940 (11 seasons)	2,110	Nov. 3, 1955	9.6	Sept. 22, 1950
-	-	-	-	-	1,000 (1 season)	-	-	4.8	July 29-31, Aug. 4, 1947
-	-	-	-	-	1,300 (1 season)	-	-	6.3	July 20, 21, 29, 30, 1947
6,480 (13 years)	807	1960	491	1947	661 (14 seasons)	333	Feb. 22, 1949	0.7	Aug. 6, 1959
-	-	-	-	-	460 (1 season)	-	-	1.5	July 30, 1947
-	908	1948	224	1947	464 (4 seasons)	-	-	0	Aug. 31 to Sept. 6, 1947
-	1,940	1950	1,410	1947	1,710 (4 seasons)	-	-	6.7	July 25, Sept. 2, 3, 1947
-	3,100	1948	2,570	1947	2,890 (4 seasons)	-	-	11	July 19-21, 1947
8,550 (13 years)	1,030	1957	783	1947	890 (14 seasons)	391	Feb. 9, 1951	3.2	Sept. 1, 1950



flow with respect to time. The three forms of presentation are discussed briefly below and are followed by the graphical and tabular expressions of the data.

### MAXIMUM-MINIMUM DAILY DISCHARGE

The hydrographs of maximum and minimum daily discharge shown on pages 70 through 90 are based on the maximum and minimum daily discharge for each day of the year throughout the period of record. The extremes of discharge thus plotted delineate a band within the boundaries of which every past daily discharge of record would lie if plotted. The hydrographs can be used to appraise the extremes of discharge to be expected throughout the year but do not define a record of continuous flow or typify the actual record for any individual year. The hydrographs approach the category of flow-duration graphs inasmuch as the minimum daily discharge hydrograph presents daily mean discharge that has been equaled or exceeded 100 percent of the time, while the maximum daily discharge hydrograph presents daily mean discharge that has not been exceeded at any time during the period of record. The discharge figures used for preparing these hydrographs are tabulated on pages 92 - 102.

### MAXIMUM, MINIMUM, AND AVERAGE MONTHLY DISCHARGE

The bar graphs shown on pages 70 - 90 and based on data listed on pages 103 - 108 are similar to the maximum-minimum daily discharge hydrographs in that they show, for each month, the maximum monthly discharge, the minimum monthly discharge, and the average of all the monthly discharges of record. These graphs appraise a stream's potential in more summarized form than do the daily maximum and minimum data.

### FLOW-DURATION CURVES

Flow-duration curves show the percentage of time that specified discharges were equaled or exceeded during a given period (Searcey, 1959). Such curves are used to analyze the availability and variability of streamflow and to investigate problems of water supply, power development, waste disposal, and administration of water rights. A flow-duration curve for the entire period of record in itself does not show a chronological sequence of flow, but the curves for each month of the year as shown on pages 71 through 91 provide a substitute for the chronologic sequence of events. Such curves tend to define the frequency of occurrence of discharge at any given time of the year. The flow-duration data are shown also in tabular form on pages 103 - 108.

## EVALUATION OF THE SURFACE-WATER SUPPLY

### SURFACE-WATER MAP

All surface-water sources included in this study are shown on the surface-water map (pl. 3). Names of lakes and streams are indicated when known, but the majority of smaller streams in the report area are unnamed. Numbers were therefore assigned to each individual stream system terminating at salt water to avoid confusion in identification. Many small

seeps and springs issue from aquifers which crop out in various areas along the shore; however, these were generally omitted from the map and numbering system unless they discharged into well-defined drainage courses.

The stream numbers appear in red near the mouth of each stream and run consecutively in a clockwise direction around the periphery of the Kitsap Peninsula starting near the terminus of Hood Canal and ending at North Bay. The numbering system is continued in a like manner for each island beginning at the north end of Bainbridge Island and ending near the north end of Anderson Island. A study of available maps combined with a thorough field investigation indicated there are a total of 582 separate identifiable stream systems within the area under study. Of these, 426 are located on the Kitsap Peninsula proper, 38 on Bainbridge Island, 83 on Vashon and Maury Islands, 8 on Fox Island, 4 on McNeil Island and 23 on Anderson Island. As a consequence of their small size, no well established stream systems occur on the other islands included in the report.

Within each separate drainage basin terminating in salt water another system of numbering is used to identify tributary streams and their sub-basins. In this system each tributary confluence with the main stem or with another tributary is assigned a number which appears in blue on the map. Beginning with zero at the mouth, each primary tributary confluence with the main stream is numbered consecutively in an upstream direction. Using the primary confluence number as a base, a similar consecutive numbering system is then applied to the branches of each primary tributary to indicate secondary points of confluence and so on until every confluence point is numbered. In all cases each additional number is separated from the other base numbers by a colon. To alleviate congestion, confluence numbers of zero are omitted from the map, since in all cases, they simply refer to the mouth of the stream.

The surface-water map also shows the locations and numbers of all streamflow gaging stations, miscellaneous flow measurement points and surface-water quality stations listed in tables 10, 11 and 56.

### REPORT AREA YIELD

In the Kitsap Peninsular region continuous-record stream gaging started in 1945 primarily as the result of increased concern by the City of Bremerton to find an adequate municipal water supply. Of the 18 stations installed in this area during the 3-year period, 1945-47, only 4 were still in operation as of 1960 and 7 have less than 5 years of record. Since no data were collected before this time, it seemed justifiable to limit the surface-water analysis to the 15-year period 1946-60.

When the water resource inventory program was initiated, however, the years 1908-33 and 1934-59 were established as common periods for analyzing data in all reports (p. 8 - 9). At that time a preliminary study of precipitation and streamflow records indicated that over most of Washington similar average climatic trends seemed to repeat during these 26-year periods. This investigation also showed a general deficiency of data, especially streamflow records, prior to 1930. Therefore, of the 2 periods, the years 1934-59 were most suitable for use in all analyses.

To comply with this previously established criteria, in the surface-water analysis it was necessary to extrapolate data obtained during the 15-year period to obtain information representative of the 26-year periods. This was accomplished through use of annual runoff ratios.

Table 11. MISCELLANEOUS LOW FLOW DISCHARGE MEASUREMENTS.

Map No.	Stream	Location	Drain. area (sq mi)	Publication (WSP)	Minimum discharge measured	
					Cfs	Date
KITSAP PENINSULA						
KP1	Unnamed stream (tributary to Union River)	SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 34, T. 24 N., R. 1 W., at mouth, 250 ft below gaging station on Union River and 7 miles west of Bremerton.	1.23	1246	1.26	Jan. 10, 1952
KP2	Union River	SW $\frac{1}{4}$ sec. 3, T. 23 N., R. 1 W., at crossing of Old Navy Yard Highway, 5 miles northeast of Belfair.	6.96	962, 982, 1092, 1566, 1636	1.13	Sept. 29, 1943
KP3	Bear Creek	SE $\frac{1}{4}$ sec. 9, T. 23 N., R. 1 W., at crossing of Old Navy Yard Highway 3 miles north of Belfair.	1.40	1092, 1122, 1566, 1636	0.61	Sept. 19, 1947
KP4	Unnamed stream (tributary to Union River)	About east line sec. 17, T. 23 N., R. 1 W., at crossing of Old Navy Yard Highway, 2 miles north of Belfair.	0.39	1092, 1566, 1636	0	Aug. 14, 1958 Aug. 19, 1959
KP5	Courtney Creek	NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 20, T. 23 N., R. 1 W., at crossing of Old Navy Yard Highway, 1 $\frac{1}{2}$ miles north of Belfair.	1.48	1092, 1566, 1636	2.83	Aug. 14, 1958
KP6	Unnamed stream (tributary to Union River)	NE $\frac{1}{4}$ sec. 29, T. 23 N., R. 1 W., at crossing of Old Navy Yard Highway, $\frac{1}{2}$ mile north of Belfair.	1.31	1092, 1566, 1636	0.83	Aug. 14, 1958
KP7	Unnamed stream (tributary to Union River)	SE $\frac{1}{4}$ sec. 29, T. 23 N., R. 1 W., at highway crossing at Belfair.	0.53	1092, 1566, 1636	0.89	Aug. 14, 1958
KP8	Unnamed stream (tributary to Union River)	SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 30, T. 23 N., R. 1 W., at road crossing, $\frac{1}{4}$ mile above mouth and 3/4 mile west of Belfair.	0.20	1092, 1566, 1636	0	Sept. 24, 1947
KP9	Mission Creek	NE $\frac{1}{4}$ sec. 36, T. 23 N., R. 2 W., at road crossing, 3/4 mile above mouth and 2 miles west of Belfair.	13.1	1092, 1122, 1566, 1636	5.63	Aug. 25, 1947
KP10	Little Mission Creek	NW $\frac{1}{4}$ sec. 1, T. 22 N., R. 2 W., at road crossing, $\frac{1}{4}$ mile above mouth and 3 miles southwest of Belfair.	1.51	1092, 1566, 1636	2.02	Aug. 25, 1947
KP11	Johnson Creek (tributary to Hood Canal)	About center of sec. 2, T. 22 N., R. 2 W., at road crossing 500 ft above mouth and 3 $\frac{1}{2}$ miles southwest of Belfair.	0.66	1092, 1566, 1636	0.19	Aug. 25, 1947
KP12	Stimson Creek	NW $\frac{1}{4}$ sec. 11, T. 22 N., R. 2 W., at road crossing, 400 ft above mouth and 4 $\frac{1}{2}$ miles southwest of Belfair.	1.86	1092, 1566, 1636	0.82	Aug. 15, 1958
KP13	Unnamed stream (tributary to Hood Canal)	SE $\frac{1}{4}$ sec. 9, T. 22 N., R. 2 W., at road crossing, 400 ft above mouth and 6 miles southwest of Belfair.	0.30	1092, 1566, 1636	0.10	Aug. 26, 1947
KP14	Little Shoofly Creek	NW $\frac{1}{4}$ sec. 17, T. 22 N., R. 2 W., at road crossing at mouth, 7 $\frac{1}{2}$ miles southwest of Belfair.	0.66	1092, 1566, 1636	0.66	Aug. 26, 1947
KP15	Shoofly Creek	SW $\frac{1}{4}$ sec. 18, T. 22 N., R. 2 W., at road crossing, 400 ft above mouth and 8 $\frac{1}{2}$ miles southwest of Belfair.	0.88	1092, 1566, 1636	0.02	Aug. 24, 1959
KP16	Unnamed stream (tributary to Tahuya River)	W $\frac{1}{2}$ sec. 2, T. 23 N., R. 2 W., at road crossing, 3/4 mile above mouth and 5 $\frac{1}{2}$ miles northwest of Belfair.	2.03	1092, 1566	0	Aug. 26, 1947 Aug. 15, 1958
KP17	Unnamed stream (tributary to Tahuya River)	Near center sec. 33, T. 23 N., R. 2 W., 200 ft below road crossing, 1 mile above mouth and 5 miles west of Belfair.	4.19	1092, 1566	0	Aug. 15, 1958

Table 11. MISCELLANEOUS LOW FLOW DISCHARGE MEASUREMENTS. (Continued)

Map No.	Stream	Location	Drain. area (sq mi)	Publication (WSP)	Minimum discharge measured	
					Cfs	Date
KITSAP PENINSULA (continued)						
KP18	Unnamed stream (tributary to Tahuya River)	SE½ sec. 22, T. 22 N., R. 3 W., at road crossing, 400 ft above mouth and ½ mile north-east of Tahuya.	1.20	1566	0	Aug. 18, 1958
KP19	Caldervin Creek	NW½ sec. 27, T. 22 N., R. 3 W., at road crossing, 400 ft above mouth at Tahuya.	1.09	1092	1.34	Aug. 26, 1947
KP20	Rendsland Creek	N½ sec. 19, T. 22 N., R. 3 W., at road crossing at mouth, 3 miles west of Tahuya.	8.74	1092	0	Aug. 26, 1947
KP21	Dewatto Creek	SE½ sec. 32, T. 24 N., R. 2 W., at road crossing, 2½ miles south of Holley.	3.01	1092, 1566	0.40	Aug. 26, 1947
KP22	Ludvick Lake Creek	Near center sec. 6, T. 23 N., R. 2 W., at road crossing, ¼ mile above mouth and 3 miles south of Holley.	1.01	1092, 1566	0	Aug. 26, 1947 Aug. 19, 1958
KP23	Unnamed stream (tributary to Dewatto Creek)	North line sec. 7, T. 23 N., R. 2 W., at road crossing, 500 ft above mouth and 3½ miles south of Holley.	0.72	1092, 1566	0.03	Aug. 19, 1958
KP24	Unnamed stream (tributary to Dewatto Creek)	SE½ sec. 27, T. 23 N., R. 3 W., at road crossing, 1½ miles east of Dewatto.	1.77	1092, 1122, 1566	1.27	Sept. 18, 1947
KP25	Thomas Creek	NE½ sec. 19, T. 24 N., R. 2 W., 200 ft above road crossing, 500 ft above mouth and ¼ mile northeast of Holley.	0.37	1092, 1122, 1566	2.37	Aug. 26, 1947
KP25.1	Harding Creek	NW½SW¼ sec. 9, T. 24 N., R. 2 W., at mouth.	1.37	(a)	4.85	Sept. 15, 1961
KP26	Seabeck Creek	NW½ sec. 29, T. 25 N., R. 1 W., at road crossing, ¼ mile above mouth at Seabeck.	5.06	1092, 1566	0.27	Aug. 19, 1958
KP27	Big Beef Creek	North line sec. 8, T. 24 N., R. 1 W., at road crossing, 3 miles south of Seabeck.	5.69	1092, 1566	0.61	Sept. 30, 1947
KP28	Big Beef Creek	North line NE½ sec. 22, T. 25 N., R. 1 W., about ¼ mile above mouth and 2½ miles northeast of Seabeck.	14.0	1092, 1566	3.91	Aug. 20, 1958
KP29	Johnson Creek	NW½ sec. 14, T. 25 N., R. 1 W., at road crossing near mouth, 3 miles northeast of Seabeck.	0.66	1092, 1566	0.05	Aug. 27, 1947
KP30	Anderson Creek	NW½ sec. 13, T. 25 N., R. 1 W., at road crossing, ½ mile above mouth and 4 miles north-east of Seabeck.	4.04	1092, 1566	2.07	Sept. 18, 1947
KP31	Unnamed stream (tributary to Anderson Creek)	NE½ sec. 14, T. 25 N., R. 1 W., at road crossing near mouth and 4 miles northeast of Seabeck.	0.37	1092, 1566	0.19	Aug. 27, 1947
KP32	South branch unnamed stream (tributary to Hood Canal)	W½ sec. 23, T. 27 N., R. 1 E., at road crossing, 600 ft above north branch and 3½ miles southwest of Port Gamble.	1.97	1092, 1566	0.01	Aug. 25, 1947
KP33	North branch unnamed stream (tributary to Hood Canal)	W½ sec. 23, T. 27 N., R. 1 E., at road crossing, 400 ft above south branch and 3½ miles southwest of Port Gamble.	0.86	1092, 1566	0.08	Aug. 25, 1947
KP34	Unnamed stream (tributary to Hood Canal)	NW½ sec. 13, T. 27 N., R. 1 E., at road crossing, ¼ mile above mouth and 2½ miles south-west of Port Gamble.	0.59	1092, 1566	0.82	Aug. 25, 1947

(a) Surface Water Records of Washington, 1961.



Table 11. MISCELLANEOUS LOW FLOW DISCHARGE MEASUREMENTS. (Continued)

Map No.	Stream	Location	Drain. area (sq mi)	Publication (WSP)	Minimum discharge measured	
					Cfs	Date
KITSAP PENINSULA (continued)						
KP35	Gamble Creek	SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 29, T. 27 N., R. 2 E., at road crossing, 1 $\frac{1}{2}$ miles above mouth and 4 miles south of Port Gamble.	4.87	1092, 1566	0.45	Aug. 25, 1947
KP36	Unnamed stream (tributary to Gamble Creek)	SW $\frac{1}{4}$ sec. 20, T. 27 N., R. 2 E., at road crossing, 900 ft above mouth and 2 $\frac{1}{2}$ miles south of Port Gamble.	0.86	1092, 1566	0.10	Aug. 26, 1958
KP37	Buck Lake Outlet	SW $\frac{1}{4}$ sec. 16, T. 28 N., R. 2 E., at road crossing, 600 ft above mouth and $\frac{1}{2}$ mile west of Hansville.	0.33	1092, 1566	0	Aug. 5, 1947
KP38	Silver (Egdon) Creek	NW $\frac{1}{4}$ sec. 2, T. 27 N., R. 2 E., at road crossing at Egdon, 300 ft above mouth.	2.24	1092, 1566	0.03	Aug. 26, 1958
KP39	Unnamed stream (tributary to Puget Sound)	NW $\frac{1}{4}$ sec. 11, T. 27 N., R. 2 E., at road crossing, $\frac{1}{2}$ mile above mouth and 3/4 mile south of Egdon.	0.95	1092, 1566	0.04	Aug. 26, 1958
KP40	Carpenter Lake Outlet	SW $\frac{1}{4}$ sec. 26, T. 27 N., R. 2 E., at road crossing, $\frac{1}{2}$ mile above mouth and 3/4 mile west of Kingston.	2.35	1092, 1566	0	Aug. 26, 1947 Aug. 27, 1958
KP41	Grovers Creek	NW $\frac{1}{4}$ sec. 4, T. 26 N., R. 2 E., at road crossing, $\frac{1}{2}$ mile above mouth and 2 $\frac{1}{2}$ miles northwest of Kitsap.	6.45	1092, 1566	0.33	Aug. 5, 1947
KP42	Unnamed stream (tributary to Miller Bay)	NW $\frac{1}{4}$ sec. 16, T. 26 N., R. 2 E., at road crossing, 400 ft above mouth and 1 $\frac{1}{2}$ miles west of Kitsap.	0.62	1092, 1566	0.06	Aug. 26, 1947
KP43	Thompson Creek	S $\frac{1}{2}$ sec. 29, T. 26 N., R. 2 E., at road crossing, 600 ft above mouth and 2 miles east of Keyport.	2.35	1092, 1566	0.05	Aug. 26, 1947
KP44	Unnamed stream (tributary to Puget Sound)	Northwest corner sec. 31, T. 26 N., R. 2 E., at road crossing, 1,000 ft above mouth and 3/4 mile northeast of Keyport.	1.79	1092, 1566	0	Aug. 26, 1947 Aug. 27, 1958
KP45	Unnamed stream (tributary to Puget Sound)	SE $\frac{1}{4}$ sec. 25, T. 26 N., R. 1 E., at road crossing, 600 ft above mouth and 3/4 mile north of Keyport.	1.44	1092, 1566	0.01	Aug. 27, 1958
KP46	West Fork Dogfish Creek	S $\frac{1}{2}$ sec. 11, T. 26 N., R. 1 E., at road crossing, 100 ft above East Fork and 1 $\frac{1}{2}$ miles north of Poulsbo.	2.76	1092, 1566	1.62	Aug. 26, 1958
KP47	Unnamed stream (tributary to Dogfish Creek)	NW $\frac{1}{4}$ sec. 14, T. 26 N., R. 1 E., at road crossing, 1 mile north of Poulsbo.	1.15	1092, 1566	0.18	Aug. 26, 1958
KP48	Johnson Creek	NW $\frac{1}{4}$ sec. 22, T. 26 N., R. 1 E., at highway crossing, 800 ft above mouth and 1 mile west of Poulsbo.	3.28	1092, 1566	0.68	Aug. 26, 1947
KP49	Jacques Creek	SE $\frac{1}{4}$ sec. 27, T. 26 N., R. 1 E., at road crossing $\frac{1}{2}$ mile above mouth and 1 mile northwest of Keyport.	0.41	1092, 1566	0.08	Aug. 26, 1947
KP50	Unnamed stream (tributary to Liberty Bay)	SW $\frac{1}{4}$ sec. 35, T. 26 N., R. 1 E., at road crossing, 600 ft above mouth and 3/4 mile west of Keyport.	0.36	1092, 1566	0	Aug. 25, 1958
KP51	Unnamed stream (tributary to Liberty Bay)	SE $\frac{1}{4}$ sec. 35, T. 26 N., R. 1 E., at road crossing, 600 ft above mouth and $\frac{1}{2}$ mile west of Keyport.	0.08	1092, 1566	0.05	Aug. 25, 1958

Table 11. MISCELLANEOUS LOW FLOW DISCHARGE MEASUREMENTS. (Continued)

Map No.	Stream	Location	Drain. area (sq mi)	Publication (WSP)	Minimum discharge measured	
					Cfs	Date
	KITSAP PENINSULA (continued)					
KP52	Steel Creek	SE $\frac{1}{4}$ sec. 14, T. 25 N., R. 1 E., 200 ft above road crossing and mouth, $\frac{1}{2}$ mile west of Brownsville.	4.75	1092, 1566	0.89	Aug. 26, 1947
KP53	Illahee Creek	S $\frac{1}{2}$ sec. 31, T. 25 N., R. 2 E., at mouth, 2 $\frac{1}{2}$ miles northeast of Bremerton.	1.28	1092, 1566	0.41	Aug. 27, 1947
KP54	Unnamed stream (tributary to Port Orchard)	SW $\frac{1}{4}$ sec. 7, T. 24 N., R. 2 E., at road crossing, 1,000 ft above mouth and 1 mile east of Bremerton.	0.70	1092, 1566	0.26	Aug. 27, 1947
KP55	Unnamed stream (tributary to Dyes Inlet)	NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 3, T. 24 N., R. 1 E., at road crossing, $\frac{1}{4}$ mile above mouth and $\frac{1}{4}$ mile south of Tracyton.	0.21	1092, 1566	0.05	Aug. 22, 1958
KP56	Mosher Creek	SE $\frac{1}{4}$ sec. 34, T. 25 N., R. 1 E., at road crossing, 1/8 mile north of Tracyton and $\frac{1}{4}$ mile above mouth.	1.58	1092, 1566	0.28	Aug. 26, 1947
KP57	Unnamed stream (tributary to Dyes Inlet)	NE $\frac{1}{4}$ sec. 34, T. 25 N., R. 1 E., at road crossing, 600 ft above mouth and $\frac{1}{2}$ mile north of Tracyton.	0.42	1092, 1566	0	Aug. 26, 1947 Aug. 22, 1958
KP58	Unnamed stream (tributary to Dyes Inlet)	NW $\frac{1}{4}$ sec. 34, T. 25 N., R. 1 E., at road crossing, $\frac{1}{4}$ mile above mouth and 1 mile northwest of Tracyton.	0.27	1092, 1566	0	Aug. 26, 1947
KP59	Barker Creek	SW $\frac{1}{4}$ sec. 22, T. 25 N., R. 1 E., at road crossing, 3/8 mile above mouth and 1 $\frac{1}{2}$ miles east of Silverdale.	4.02	1092, 1566	1.81	Aug. 26, 1947
KP60	West Fork Clear Creek	About south line sec. 9, T. 25 N., R. 1 E., at mouth, just above highway crossing Clear Creek, 1 $\frac{1}{2}$ miles north of Silverdale.	3.68	1092, 1566	2.16	Aug. 27, 1947
KP61	Unnamed stream (tributary to Dyes Inlet)	SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 16, T. 25 N., R. 1 E., at highway crossing, $\frac{1}{2}$ mile above mouth and $\frac{1}{2}$ mile north of Silverdale.	0.44	1092, 1566	0.06	Aug. 27, 1947
KP62	Strawberry Creek	NE $\frac{1}{4}$ sec. 20, T. 25 N., R. 1 E., at highway crossing at Silverdale, $\frac{1}{4}$ mile above mouth.	3.01	1092, 1566	1.08	Aug. 27, 1947
KP63	Knapp Creek	E $\frac{1}{2}$ sec. 20, T. 25 N., R. 1 E., at highway crossing near mouth, 3/8 mile south of Silverdale.	0.28	1092, 1566	0	Aug. 21, 1958
KP64	Unnamed stream (tributary to Dyes Inlet)	SE $\frac{1}{4}$ sec. 20, T. 25 N., R. 1 E., at highway crossing near mouth, $\frac{1}{2}$ mile south of Silverdale.	0.55	1092, 1566	0.03	Aug. 21, 1958
KP65	Woods Creek	SW $\frac{1}{4}$ sec. 29, T. 25 N., R. 1 E., at highway crossing near mouth, 1 $\frac{1}{2}$ miles south of Silverdale.	0.40	1092, 1566	0.20	Aug. 22, 1958
KP66	Unnamed stream (tributary to Dyes Inlet)	NW $\frac{1}{4}$ sec. 32, T. 25 N., R. 1 E., at highway crossing, 800 ft above mouth and 1 $\frac{3}{4}$ miles south of Silverdale.	0.17	1092, 1566	0.08	Sept. 25, 1947
KP67	Unnamed stream (tributary to Dyes Inlet)	About center W $\frac{1}{2}$ sec. 32, T. 25 N., R. 1 E., at highway crossing near mouth, 2 miles south of Silverdale.	0.05	1092, 1566	0.08	Sept. 25, 1947
KP68	Unnamed stream (tributary to Dyes Inlet)	SW $\frac{1}{4}$ sec. 32, T. 25 N., R. 1 E., at highway crossing near mouth, 2 $\frac{1}{2}$ miles south of Silverdale.	0.23	1092, 1566	0.06	Aug. 22, 1958
KP69	Unnamed stream (tributary to Dyes Inlet)	NW $\frac{1}{4}$ sec. 5, T. 24 N., R. 1 E., at highway crossing near mouth, 2 $\frac{3}{4}$ miles south of Silverdale.	0.13	1092, 1566	0.23	Aug. 27, 1947

Table 11. MISCELLANEOUS LOW FLOW DISCHARGE MEASUREMENTS. (Continued)

Map No.	Stream	Location	Drain. area (sq mi)	Publication (WSP)	Minimum discharge measured	
					Cfs	Date
KITSAP PENINSULA (continued)						
KP70	Wildcat Creek	E½ sec. 2, T. 24 N., R. 1 W., at lake outlet, 5 miles west of Bremerton.	2.50	1092, 1122, 1152, 1182, 1216, 1566	0	Sept. 17, 30, 1947 Sept. 14, 1949
KP70.1	Wildcat Creek	SW¼NW¼ sec. 7, T. 24 N., R. 1 E., 500 ft above Lost Creek.	6.20	(a)	0.14	Sept. 8, 1961
KP70.2	Lost Creek	SW¼NW¼ sec. 7, T. 24 N., R. 1 E., 500 ft above mouth.	3.08	(a)	0.73	Sept. 8, 1961
KP71	Dickenson Creek	SW¼NW¼ sec. 8, T. 24 N., R. 1 E., at lane crossing at mouth, 3 miles west of Bremerton.	2.19	1092, 1566	0.04	Aug. 5, 27, 1947
KP72	Kitsap Creek	SW¼ sec. 8, T. 24 N., R. 1 E., at lake outlet 2 miles west of Bremerton.	2.73	1092, 1122, 1152, 1182, 1216, 1566	0.08	Aug. 21, 1958
KP73	Gorst Creek	NW¼ sec. 32, T. 24 N., R. 1 E., 150 ft above Heins Creek, ¾ mile above mouth and 3½ miles southwest of Bremerton.	4.35	1092, 1566	7.68	Aug. 28, 1947
KP74	Heins Creek	About west line sec. 32, T. 24 N., R. 1 E., 200 ft above mouth and 3½ miles southwest of Bremerton.	1.63	1092, 1566	0.62	Aug. 19, 1958
KP75	Parish Creek	W½ sec. 32, T. 24 N., R. 1 E., at highway crossing, 150 ft above diversion point and 3 miles southeast of Bremerton.	1.66	1092, 1566	0.81	Aug. 28, 1947
KP76	Unnamed stream (tributary to Blackjack Creek)	West line NW¼ sec. 23, T. 23 N., R. 1 E., at road crossing, 0.2 mile above mouth and 4 miles south of Port Orchard.	1.41	1092, 1566	3.61	Aug. 19, 1958
KP77	Blackjack Creek	NW¼ sec. 11, T. 23 N., R. 1 E., at road crossing, 2 miles south of Port Orchard and 3 miles above mouth.	10.5	1092, 1566	4.75	Aug. 28, 1947
KP78	Annapolis Creek	NE¼ sec. 25, T. 24 N., R. 1 E., at road crossing at mouth, ¾ mile east of Port Orchard.	1.86	1092, 1566	0.40	Aug. 27, 1947
KP79	Unnamed stream (tributary to Port Orchard)	NW¼ sec. 30, T. 24 N., R. 2 E., 300 ft above road crossing, 400 ft above mouth and 1 mile east of Port Orchard.	0.20	1092, 1566	0.40	Aug. 21, 1958
KP80	Unnamed stream (tributary to Port Orchard)	NW¼ sec. 30, T. 24 N., R. 2 E. at highway crossing 1 mile east of Port Orchard.	0.07	1566	0.17	Aug. 21, 1958
KP81	Sullivan Creek	SW¼ sec. 19, T. 24 N., R. 2 E., 300 ft above road crossing, 400 ft above mouth and 1½ miles northeast of Port Orchard.	1.00	1092, 1566	0.36	Aug. 21, 1958
KP82	Unnamed stream (tributary to Port Orchard)	NE¼ sec. 19, T. 24 N., R. 2 E., at road crossing at mouth and 2 miles northeast of Port Orchard.	0.25	1092, 1566	0.02	Aug. 21, 1958
KP83	Unnamed stream (tributary to Port Orchard)	NE¼ sec. 17, T. 24 N., R. 2 E., at road crossing at mouth, 3½ miles northeast of Port Orchard.	0.32	1092, 1566	0	Aug. 27, 1947 Aug. 21, 1958
KP84	Unnamed stream (tributary to Port Orchard)	South line sec. 8, T. 24 N., R. 2 E., at road crossing, ⅜ mile above mouth and 4 miles northeast of Port Orchard.	0.40	1092, 1566	0.06	Aug. 27, 1947
KP85	Beaver Creek	W½ sec. 16, T. 24 N., R. 2 E., at road crossing, ¼ mile above mouth and 3 miles east of Bremerton	1.61	1092, 1566	0.44	Aug. 27, 1947

(a) Surface Water Records of Washington, 1961.

Table 11. MISCELLANEOUS LOW FLOW DISCHARGE MEASUREMENTS. (Continued)

Map No.	Stream	Location	Drain. area (sq mi)	Publication (WSP)	Minimum discharge measured	
					Cfs	Date
KITSAP PENINSULA (continued)						
KP86	Duncan Creek	SW $\frac{1}{4}$ sec. 22, T. 24 N., R. 2 E., at road crossing, at Manchester, 500 feet above mouth.	0.45	1092, 1566	0.04	Aug. 27, 1947
KP87	Salmonberry Creek	South Line sec. 7, T. 23 N., R. 2 E., at road crossing, $\frac{1}{2}$ mile above mouth and 3 $\frac{1}{2}$ miles south-east of Port Orchard.	4.99	1092, 1566	1.29	Aug. 21, 1958
KP88	Curley Creek	NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 8, T. 23 N., R. 2 E., 1 mile below Long Lake outlet and 4 miles southeast of Port Orchard.	11.6	1092, 1216, 1566	3.13	July 28, 1958
KP89	Unnamed stream (tributary to Yukon Harbor)	SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 34, T. 24 N., R. 2 E., at road crossing near mouth, 1 mile west of Harper.	0.21	1092, 1566	0.03	Aug. 28, 1947
KP90	Unnamed stream (tributary to Yukon Harbor)	SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 34, T. 24 N., R. 2 E., at road crossing near mouth, 3/4 mile west of Harper.	0.05	1092, 1566	0	Aug. 28, 1947 Aug. 21, 1958
KP91	Wilson Creek (tributary to Yukon Harbor)	S $\frac{1}{2}$ sec. 34, T. 24 N., R. 2 E., at road crossing at mouth, 5/8 mile west of Harper.	0.96	1092, 1566	0	Aug. 28, 1947
KP92	Unnamed stream (tributary to Yukon Harbor)	SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 34, T. 24 N., R. 2 E., at road crossing at mouth, $\frac{1}{2}$ mile west of Harper.	0.42	1092, 1566	0	Aug. 28, 1947
KP93	Unnamed stream (tributary to Puget Sound)	NW $\frac{1}{4}$ sec. 2, T. 23 N., R. 2 E., at road crossing at mouth, 3/8 mile south of Harper.	0.43	1092, 1566	0	Aug. 21, 1958
KP94	Olalla Creek	North line sec. 5, T. 22 N., R. 2 E., at road crossing, 1 $\frac{1}{2}$ miles above mouth and 2 miles west of Olalla.	3.88	1092, 1566	3.03	July 28, 1958
KP95	Crescent Creek	N $\frac{1}{2}$ sec. 32, T. 22 N., R. 2 E., at road crossing, 1 mile above mouth and 1 $\frac{1}{2}$ miles north of Gig Harbor.	4.64	1092, 1566	1.27	July 31, 1947
KP96	Sullivan Creek	SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 29, T. 21 N., R. 2 E., at road crossing near mouth and 3 $\frac{1}{2}$ miles south of Gig Harbor.	1.61	1092, 1566	0.04	Aug. 29, 1947
KP97	Unnamed stream (tributary to Wollochet Bay)	SW $\frac{1}{4}$ sec. 19, T. 21 N., R. 2 E., at road crossing at mouth, 3 miles south of Gig Harbor.	1.87	1092, 1566	0.01	Aug. 29, 1947
KP98	Unnamed stream (tributary to Wollochet Bay)	NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 24, T. 21 N., R. 1 E., at road crossing, 500 ft above mouth and 2 $\frac{1}{2}$ miles southwest of Gig Harbor.	2.52	1092, 1566	0.01	Aug. 29, 1947
KP99	Artondale Creek	NE $\frac{1}{4}$ sec. 24, T. 21 N., R. 1 E., at road crossing near mouth, 2 $\frac{1}{2}$ miles southwest of Gig Harbor.	2.99	1092, 1566	0.76	Aug. 20, 1958
KP100	Unnamed stream (tributary to Hale Passage)	SW $\frac{1}{4}$ sec. 25, T. 21 N., R. 1 E., at road crossing at mouth, 4 miles southwest of Gig Harbor.	0.10	1092, 1566	0	Aug. 29, 1947 Aug. 20, 1958
KP101	Unnamed stream (tributary to Hale Passage)	NE $\frac{1}{4}$ sec. 26, T. 21 N., R. 1 E., at road crossing at mouth, 4 miles southwest of Gig Harbor.	0.19	1092, 1566	0.03	Aug. 20, 1958
KP102	Warren Creek	SE $\frac{1}{4}$ sec. 22, T. 21 N., R. 1 E., at road crossing near mouth, 4 $\frac{1}{2}$ miles southwest of Gig Harbor.	0.83	1092, 1566	0.06	Aug. 20, 1958 Aug. 29, 1947

Table 11. MISCELLANEOUS LOW FLOW DISCHARGE MEASUREMENTS. (Continued)

Map No.	Stream	Location	Drain. area (sq mi)	Publication (WSP)	Minimum discharge measured	
					Cfs	Date
KITSAP PENINSULA (continued)						
KP103	Unnamed stream (tributary to Henderson Bay)	SE $\frac{1}{2}$ sec. 9, T. 21 N., R. 1 E., at road crossing at mouth, 1 $\frac{1}{2}$ miles southwest of Rosedale.	0.14	1092, 1566	0.06	Aug. 20, 1958
KP104	Unnamed stream (tributary to Henderson Bay)	SE $\frac{1}{2}$ sec. 10, T. 21 N., R. 1 E., 200 ft above road crossing, $\frac{1}{2}$ mile from mouth and 3/4 mile south of Rosedale.	2.03	1092, 1566	0.64	Aug. 20, 1958
KP105	Meyer Creek	SW $\frac{1}{2}$ SW $\frac{1}{4}$ sec. 2, T. 21 N., R. 1 E., at road crossing at mouth, at Rosedale.	0.71	1092, 1566	0.96	Aug. 20, 1958
KP106	Unnamed stream (tributary to Henderson Bay)	SE $\frac{1}{2}$ NW $\frac{1}{4}$ sec. 2, T. 21 N., R. 1 E., at road crossing 3/4 mile above mouth and 3/4 mile north of Rosedale.	0.52	1092, 1566	0.02	Aug. 29, 1947
KP107	McCormick Creek	NW $\frac{1}{2}$ sec. 25, T. 22 N., R. 1 E., at road crossing 500 ft above mouth and 1 mile south of Purdy.	2.36	1092, 1566	0.93	Aug. 29, 1947
KP108	Unnamed stream (tributary to Henderson Bay)	W $\frac{1}{2}$ sec. 24, T. 22 N., R. 1 E., at road crossing 800 ft above mouth and $\frac{1}{2}$ mile south of Purdy.	1.55	1092, 1566	0.02	Aug. 21, 1958
KP109	Purdy Creek	SW $\frac{1}{2}$ sec. 13, T. 22 N., R. 1 E., at road crossing near mouth, $\frac{1}{4}$ mile north of Purdy.	3.44	1092, 1566	1.44	Aug. 28, 1947
KP110	Unnamed stream (tributary to Burley Creek)	About center of sec. 1, T. 22 N., R. 1 E., at road crossing $\frac{1}{2}$ mile above mouth and 3/4 mile north of Burley.	0.52	1092, 1566	0.05	Aug. 18, 1958
KP111	Bear Creek (tributary to Burley Creek)	East line SE $\frac{1}{2}$ sec. 2, T. 22 N., R. 1 E., 300 ft above mouth at Burley.	1.99	1092, 1566	2.25	Sept. 26, 1947
KP112	Unnamed stream (tributary to Burley Creek)	NE $\frac{1}{2}$ NE $\frac{1}{4}$ sec. 11, T. 22 N., R. 1 E., at mouth at Burley.	0.51	1092, 1566	0.16	Aug. 26, 1947
KP113	Minter Creek	Southwest corner sec. 16, T. 22 N., R. 1 E., above road crossing, $\frac{1}{4}$ mile above Huge Creek and 2 $\frac{1}{2}$ miles west of Wauna.	5.67	1092, 1122, 1286, 1566	5.30	July 17, 1958
KP114	South Fork Minter Creek	About center west line sec. 21, T. 22 N., R. 1 E., at road crossing, $\frac{1}{4}$ mile above mouth and 2 miles west of Wauna.	2.34	1092, 1566	0	Aug. 29, 1947 Aug. 11, 1958
KP115	Lackey Creek	SW $\frac{1}{2}$ sec. 30, T. 22 N., R. 1 E., at highway crossing, 1 mile above mouth and 4 miles southwest of Wauna.	1.78	1092, 1566	0	Aug. 29, 1947 Aug. 11, 1958
KP116	Unnamed stream (tributary to Carr Inlet)	NW $\frac{1}{2}$ sec. 35, T. 21 N., R. 1 W., at road crossing at Home, $\frac{1}{4}$ mile above mouth. <u>Note</u> -- Enters Von Geldern Cove from north.	1.22	1092, 1566	0.21	Aug. 29, 1947
KP117	Unnamed stream (tributary to Carr Inlet)	NW $\frac{1}{2}$ sec. 35, T. 21 N., R. 1 W., at Home, $\frac{1}{4}$ mile above mouth. Stream enters Von Geldern Cove from west.	2.60	1092, 1566	0	Aug. 13, 1958
KP118	Dutcher Creek	S $\frac{1}{2}$ sec. 11, T. 21 N., R. 1 W., 100 ft below highway crossing, $\frac{1}{2}$ mile above mouth and 2 $\frac{1}{2}$ miles north of Home.	2.25	1092, 1566	0.13	Aug. 11, 1958
KP119	Unnamed stream (tributary to Case Inlet)	SW $\frac{1}{2}$ SW $\frac{1}{4}$ sec. 36, T. 22 N., R. 1 W., at road crossing $\frac{1}{2}$ mile above mouth and 4 $\frac{1}{2}$ miles north of Home.	0.89	1092, 1566	0.09	Aug. 29, 1947

Table 11. MISCELLANEOUS LOW FLOW DISCHARGE MEASUREMENTS. (Continued)

Map No.	Stream	Location	Drain. area (sq mi)	Publication (WSP)	Minimum discharge measured	
					Cfs	Date
KITSAP PENINSULA (continued)						
KP120	Unnamed stream (tributary to Case Inlet)	NE $\frac{1}{4}$ sec. 2, T. 21 N., R. 1 W., at road crossing at mouth, at Vaughn and 4 $\frac{1}{2}$ miles north of Home. Stream enters Vaughn Bay from north.	2.44	1092, 1566	0.01	Aug. 29, 1947
KP121	Rocky Creek	NE $\frac{1}{4}$ sec. 27, T. 22 N., R. 1 W., at highway crossing, 500 ft above mouth and 2 $\frac{1}{2}$ miles east of Allyn.	18.1	1092, 1566	3.49	Aug. 29, 1947
KP122	Unnamed stream (tributary to Coulter Creek)	S $\frac{1}{2}$ sec. 4, T. 22 N., R. 1 W., at road crossing, 0.2 mile above mouth and 2 $\frac{1}{2}$ miles south of Belfair.	2.71	1092, 1566	0.32	Aug. 28, 1947
KP123	Unnamed stream (tributary to Coulter Creek)	SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 9, T. 22 N., R. 1 W., at road crossing at mouth and 2 $\frac{3}{4}$ miles south of Belfair.	1.03	1092, 1566	1.27	Aug. 28, 1947
KP124	Unnamed stream (tributary to Coulter Creek)	SW $\frac{1}{4}$ sec. 9, T. 22 N., R. 1 W., 50 ft above mouth and 3 miles south of Belfair. Stream enters Coulter Creek above station 126.	0.20	1092, 1566	1.14	Aug. 28, 1947
KP125	Coulter Creek	SW $\frac{1}{4}$ sec. 9, T. 22 N., R. 1 W., 200 ft above road crossing at mouth and 1 $\frac{1}{2}$ miles north of Allyn.	14.1	1092, 1566	15.1	July 30, 1947
BAINBRIDGE ISLAND						
BA1	Unnamed stream (tributary to Murden Cove)	SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 15, T. 25 N., R. 2 E., 50 ft below road crossing near mouth.	1.54	(a)	0.19	Aug. 7, 1961
BA2	Unnamed stream (tributary to Fletcher Bay)	SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 21, T. 25 N., R. 2 E., at road crossing on Bainbridge Island.	0.67	(a)	0.34	Aug. 7, 1961
BA3	Unnamed stream (tributary to Manzanita Bay)	SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 9, T. 25 N., R. 2 E., at mouth.	1.57	(a)	0.81	Aug. 7, 1961
VASHON AND MAURY ISLANDS						
VA1	Unnamed stream (tributary to Puget Sound)	NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 29, T. 23 N., R. 3 E., at mouth.	0.64	(a)	*0.08	Aug. 4, 1961
VA2	Unnamed stream (tributary to Puget Sound)	NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 29, T. 23 N., R. 3 E., at foot bridge 100 ft above mouth.	0.48	(a)	0.12	Aug. 4, 1961
VA3	Unnamed stream (tributary to Tramp Harbor)	At southeast corner sec. 5, T. 22 N., R. 3 E., 60 ft above mouth.	0.90	(a)	0.44	Aug. 4, 1961
VA4	Unnamed stream (tributary to Tramp Harbor)	NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 8, T. 22 N., R. 3 E., 10 ft above road crossing at mouth.	0.73	(a)	0.53	Aug. 4, 1961
MA1	Unnamed stream (tributary to Tramp Harbor)	SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 15, T. 22 N., R. 3 E., at road crossing.	0.32	(a)	Dry	Aug. 4, 1961

(a) Surface Water Records of Washington, 1961.

\* Estimated

Table 11. MISCELLANEOUS LOW FLOW DISCHARGE MEASUREMENTS. (Continued)

Map. No.	Stream	Location	Drain. area (sq mi)	Publication (WSP)	Minimum discharge measured	
					Cfs	Date
VASHON AND MAURY ISLANDS (continued)						
MA2	Unnamed stream (tributary to Quarter- master Harbor)	SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 16, T. 22 N., R. 3 E., at mouth.	0.53	(a)	0.04	Aug. 4, 1961
VA5	Unnamed stream (tributary to Quarter- master Harbor)	SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 8, T. 22 N., R. 3 E., below duck pond at mouth.	0.43	(a)	0.10	Aug. 4, 1961
VA6	Judd Creek	NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 18, T. 22 N., R. 3 E., 0.1 mile above road crossing at mouth.	5.04	(a)	2.10	July 3, 1961
VA7	Fisher Creek	SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 19, T. 22 N., R. 3 E., 150 ft below road crossing at mouth.	1.95	(a)	0.88	Aug. 4, 1961
VA8	Unnamed stream (tributary to Quarter- master Harbor)	NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 24, T. 22 N., R. 2 E., 100 ft above mouth.	0.44	(a)	0.14	Aug. 4, 1961
VA9	Tahlequah Creek	SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 2, T. 21 N., R. 2 E., 400 ft above mouth.	1.17	(a)	0.31	Aug. 4, 1961
VA10	Unnamed stream (tributary to Colvos Passage)	NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 34, T. 22 N., R. 2 E., at mouth.	0.06	(a)	*0.4	Aug. 4, 1961
VA11	Unnamed stream (tributary to Colvos Passage)	SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 26, T. 22 N., R. 2 E., near mouth.	0.17	(a)	*0.4	Aug. 4, 1961
VA12	Jod Creek	NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 14, T. 22 N., R. 2 E., at mouth.	0.77	(a)	0.78	Aug. 4, 1961
VA13	Green Valley Creek	SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 11, T. 22 N., R. 2 E., 300 ft above mouth.	0.42	(a)	0.88	Aug. 4, 1961
VA14	Unnamed stream (tributary to Colvos Passage)	S $\frac{1}{2}$ NE $\frac{1}{4}$ sec. 35, T. 23 N., R. 2 E., at road crossing 0.8 mile south of cove.	0.07	(a)	*0.6	Aug. 4, 1961
VA15	Needle Creek	SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 18, T. 23 N., R. 3 E., 60 ft below road crossing near mouth.	2.83	(a)	0.23	Aug. 4, 1961

(a) Surface Water Records of Washington, 1961.

\* Estimated.

## UNION RIVER NEAR BREMERTON

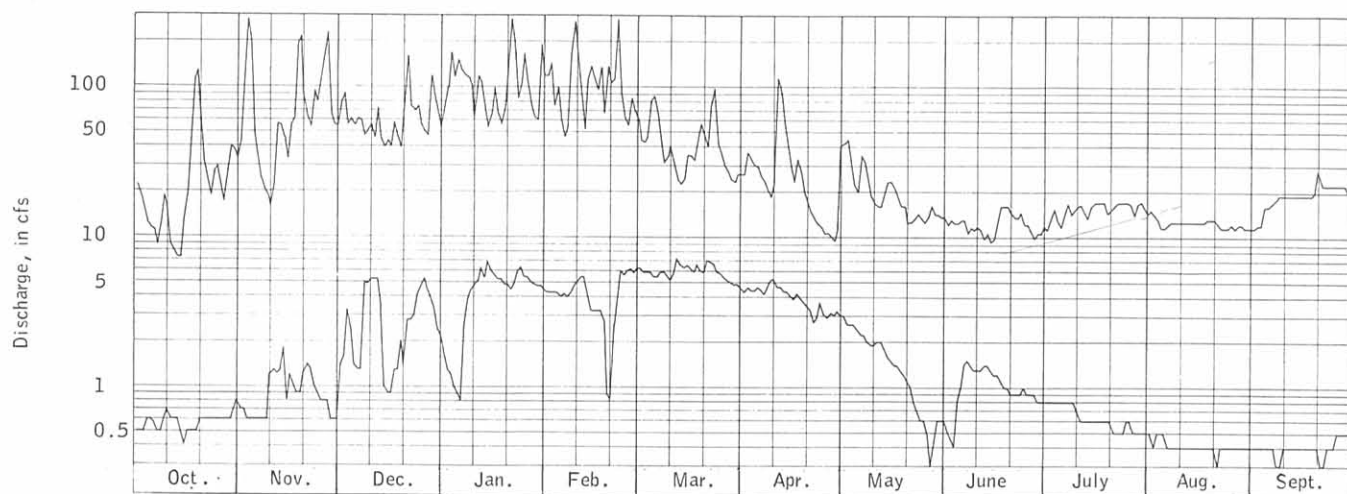


Figure 31. MAXIMUM-MINIMUM DISCHARGE HYDROGRAPHS FOR YEARS 1946-59.

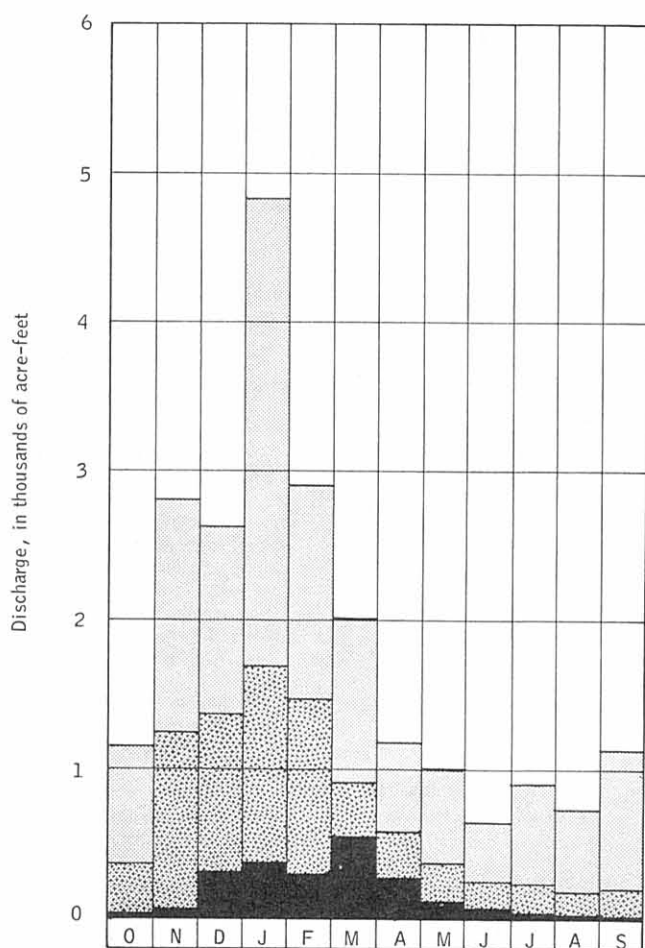


Figure 32. MAXIMUM, MINIMUM AND AVERAGE MONTHLY DISCHARGE FOR THE PERIOD 1946-59.

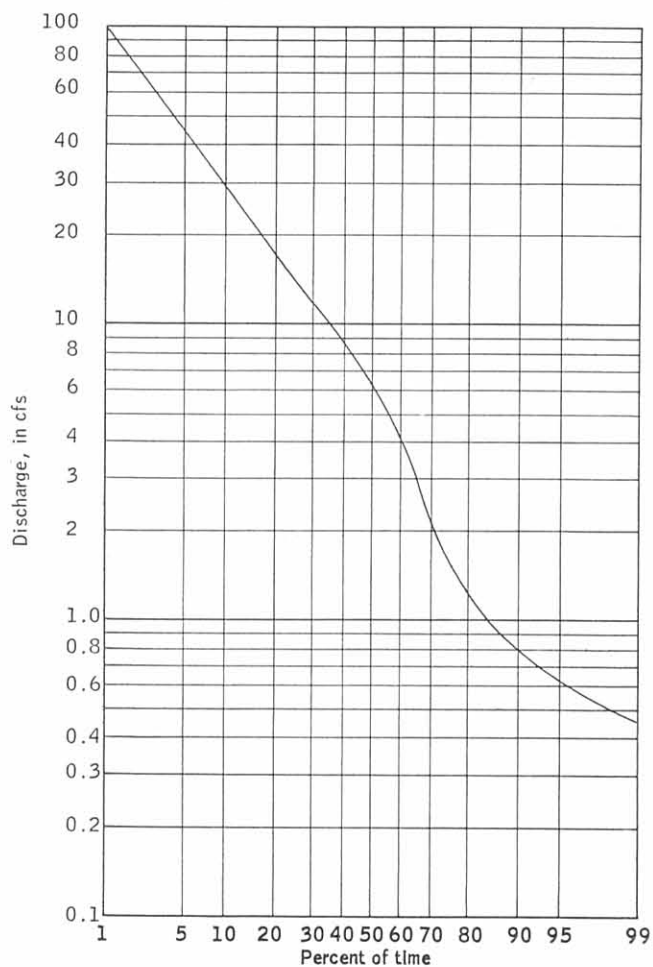


Figure 33. FLOW-DURATION CURVE FOR THE PERIOD 1946-59.



## UNION RIVER NEAR BREMERTON

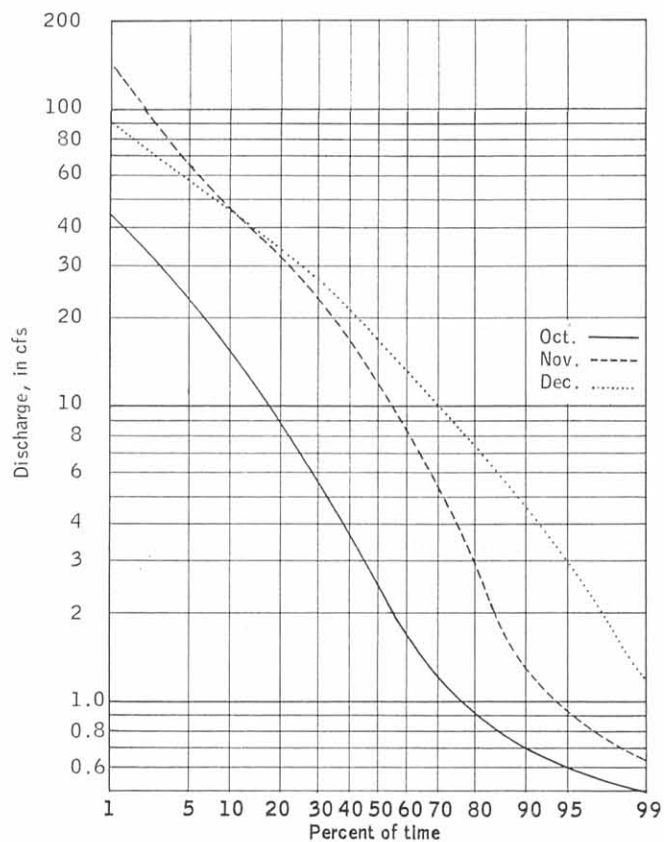


Figure 34a. FLOW-DURATION CURVES FOR OCTOBER, NOVEMBER, DECEMBER 1946-59.

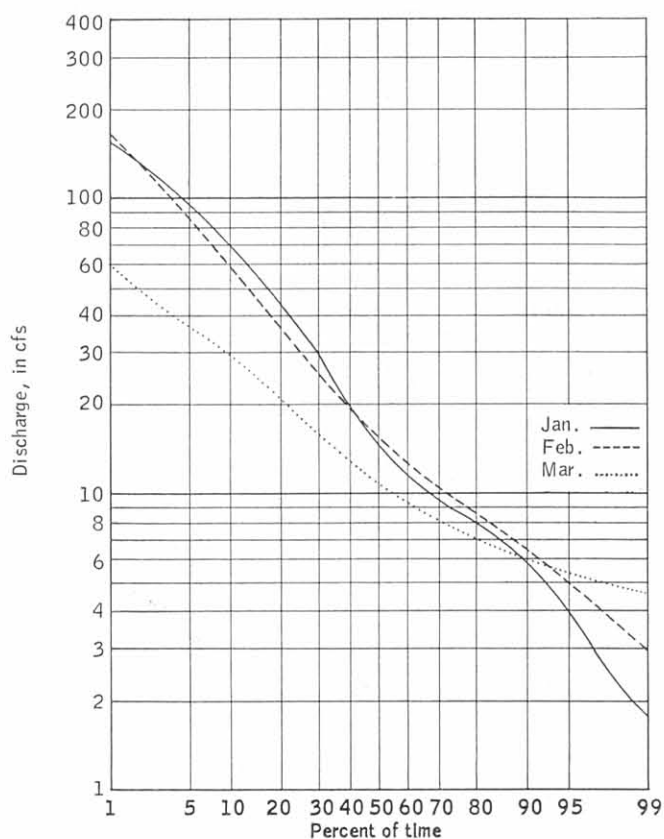


Figure 34b. FLOW-DURATION CURVES FOR JANUARY, FEBRUARY, MARCH 1946-59.

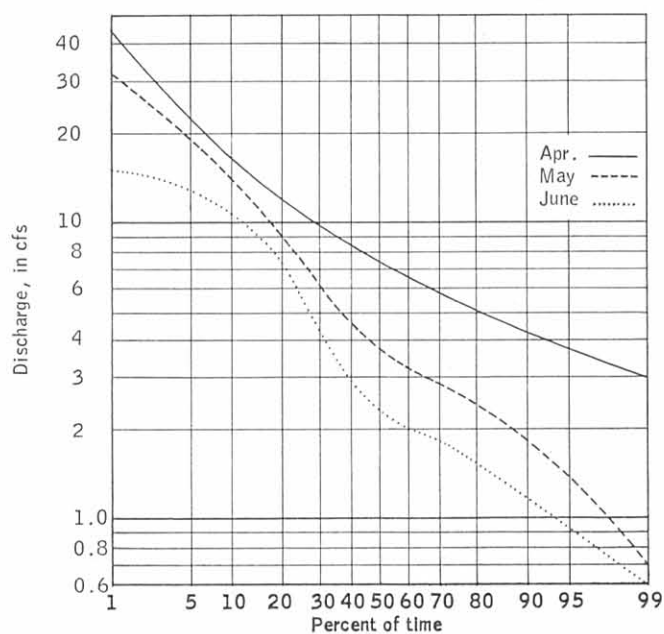


Figure 34c. FLOW-DURATION CURVES FOR APRIL, MAY, JUNE 1946-59.

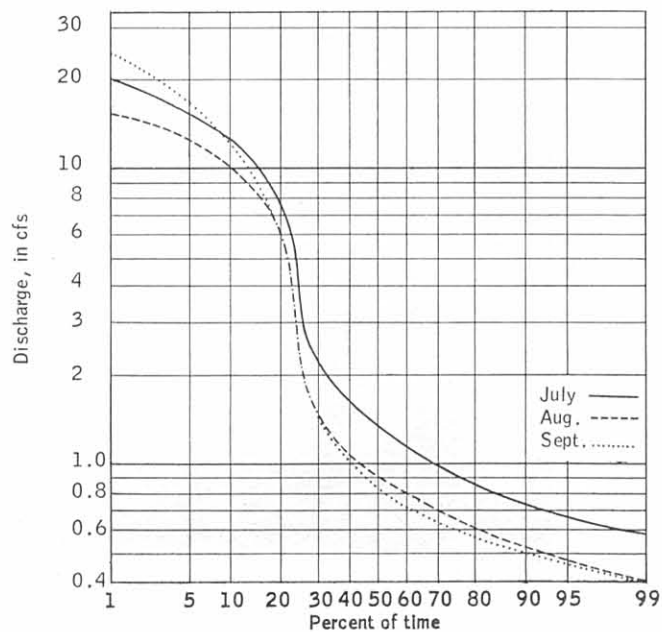


Figure 34d. FLOW-DURATION CURVES FOR JULY, AUGUST, SEPTEMBER 1946-59.

## UNION RIVER NEAR BELFAIR

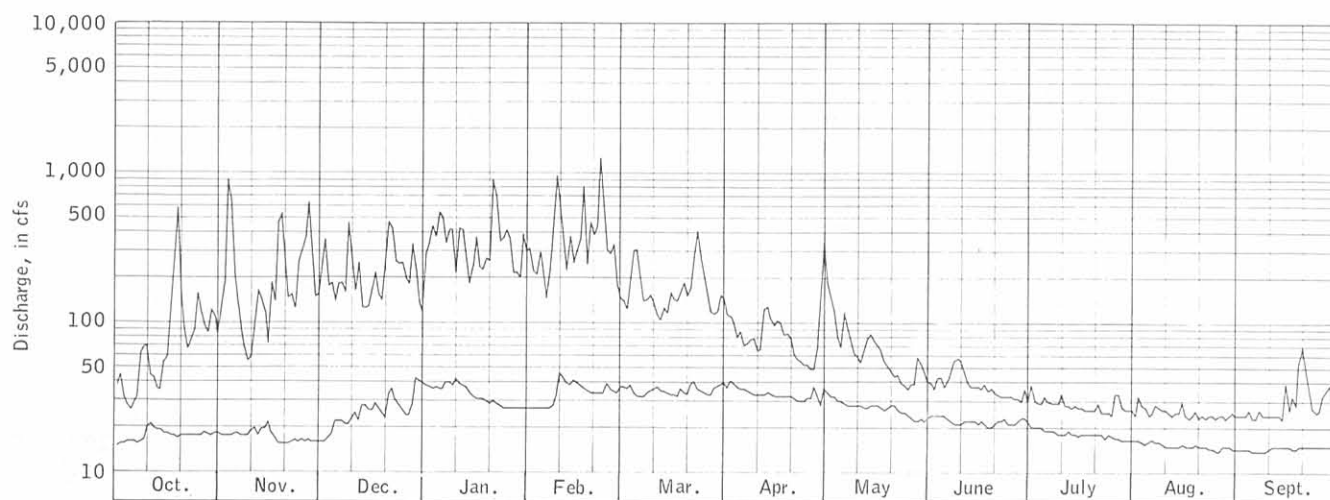


Figure 35. MAXIMUM-MINIMUM DISCHARGE HYDROGRAPHS FOR YEARS 1947-59.

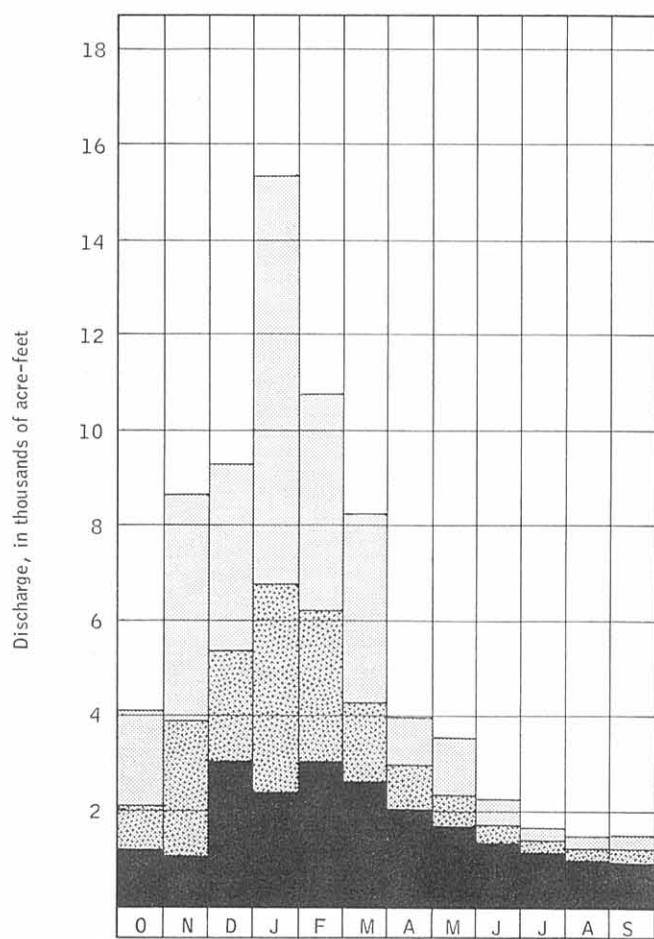


Figure 36. MAXIMUM, MINIMUM AND AVERAGE MONTHLY DISCHARGE FOR THE PERIOD 1947-59.

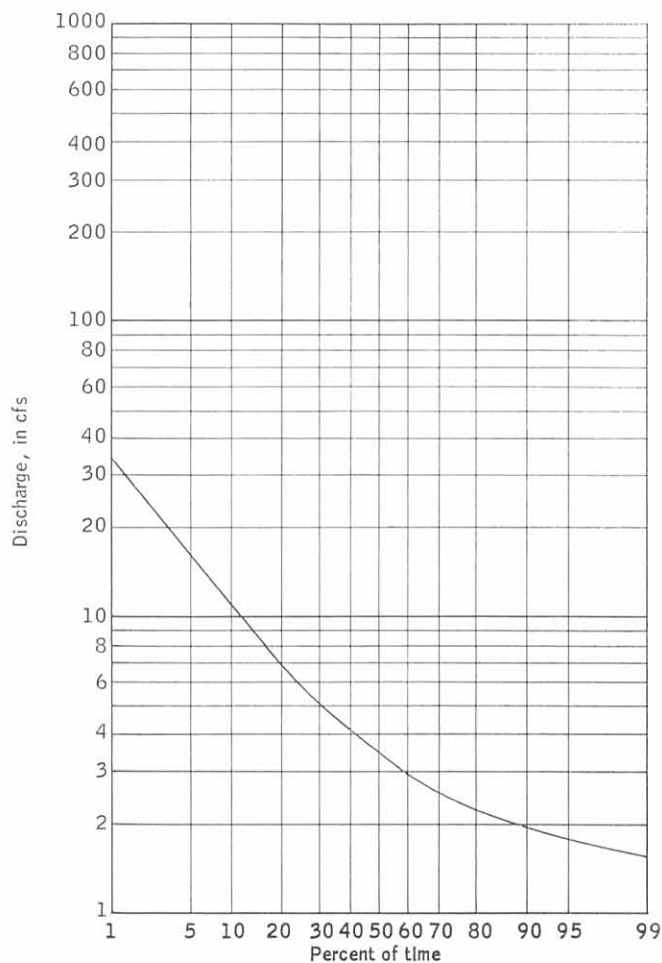


Figure 37. FLOW-DURATION CURVE FOR THE PERIOD 1948-59.

## UNION RIVER NEAR BELFAIR

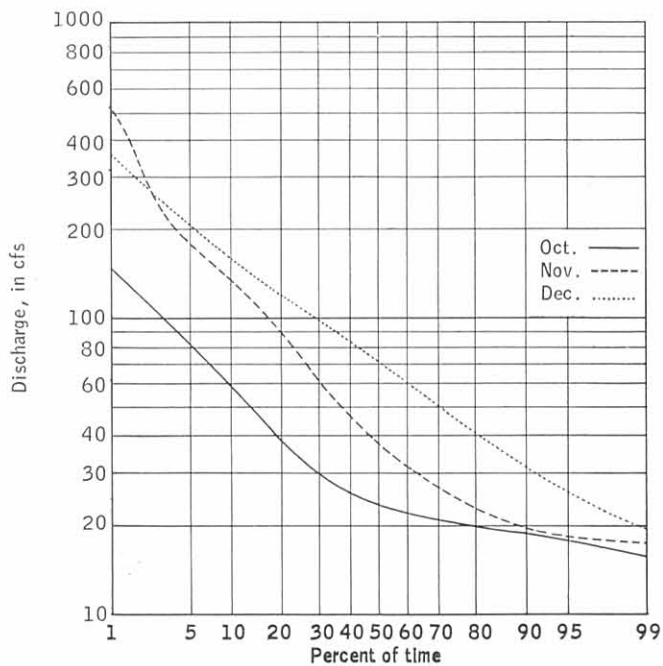


Figure 38a. FLOW-DURATION CURVES FOR OCTOBER, NOVEMBER, DECEMBER 1948-59.

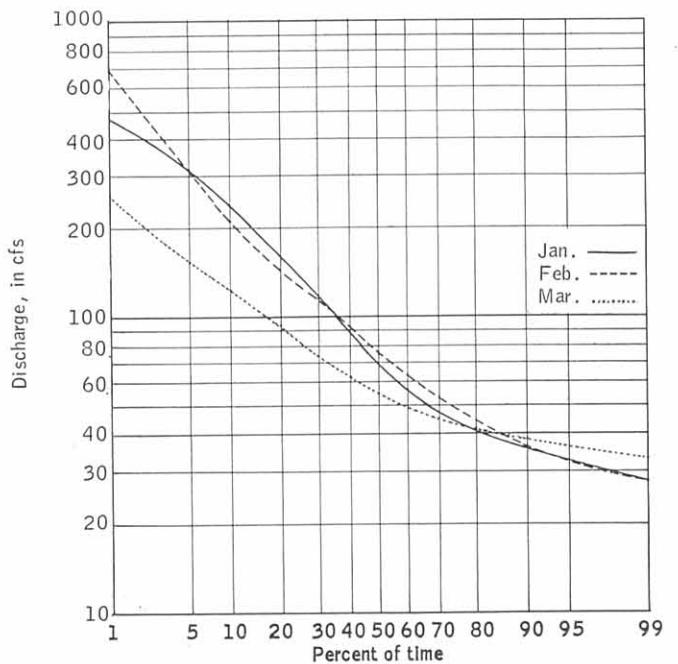


Figure 38b. FLOW-DURATION CURVES FOR JANUARY, FEBRUARY, MARCH 1948-59.

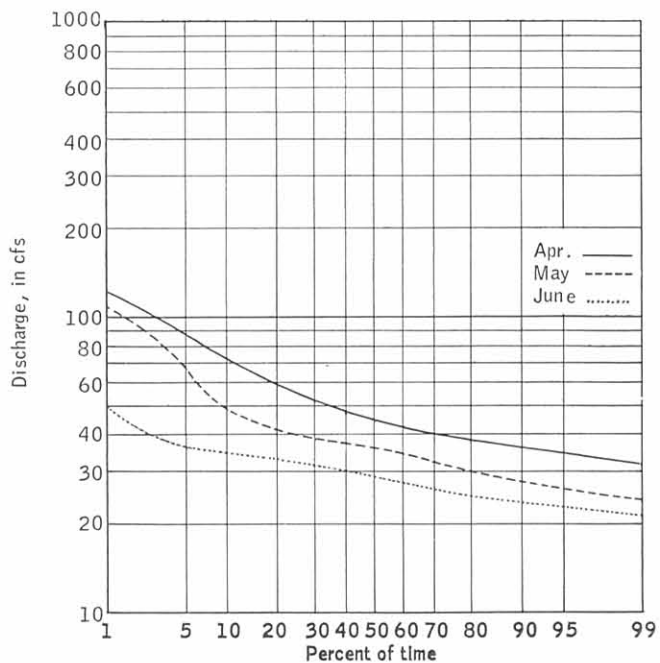


Figure 38c. FLOW-DURATION CURVES FOR APRIL, MAY, JUNE 1948-59.

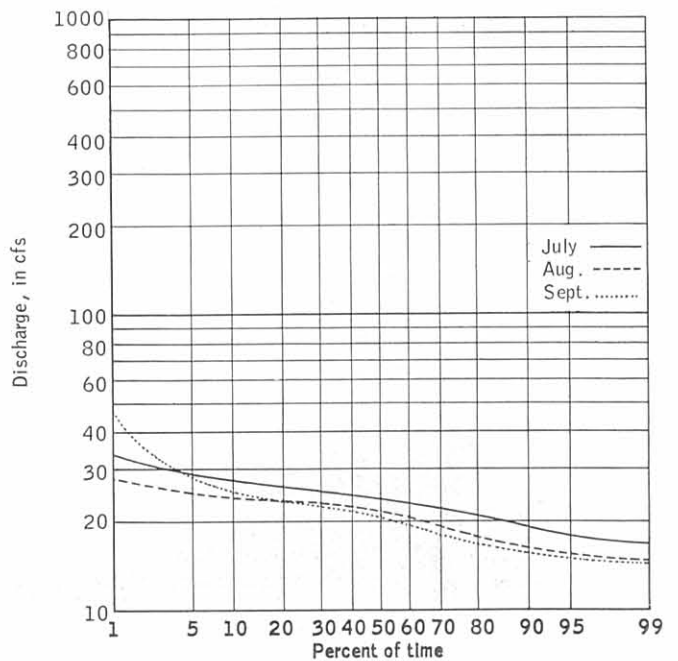


Figure 38d. FLOW-DURATION CURVES FOR JULY, AUGUST, SEPTEMBER 1948-59.

## MISSION CREEK NEAR BREMERTON

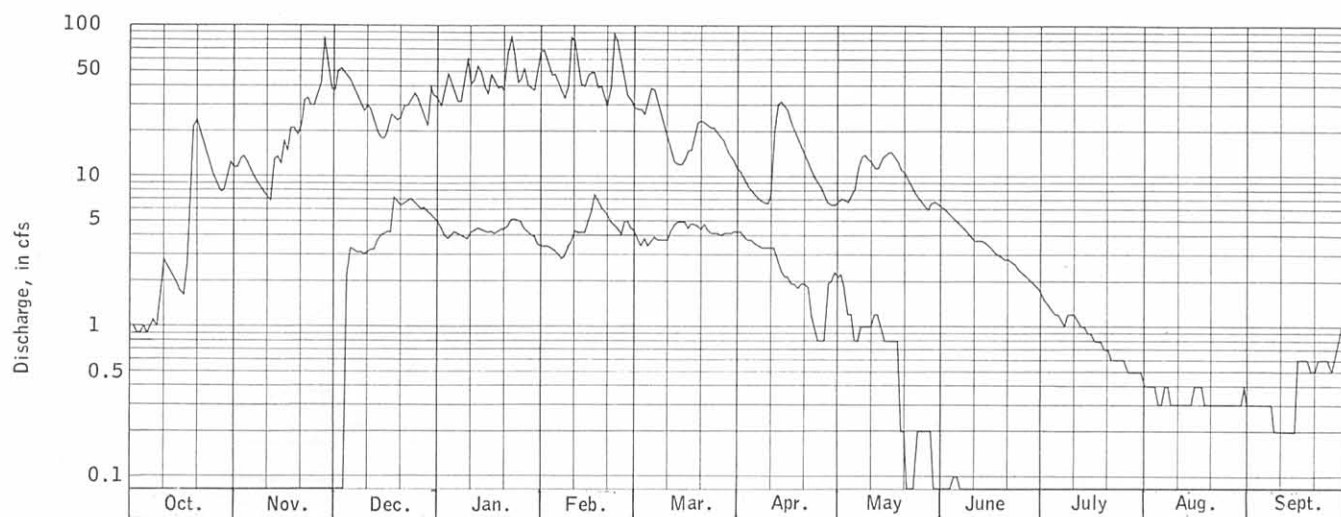


Figure 39. MAXIMUM-MINIMUM DISCHARGE HYDROGRAPHS FOR YEARS 1945-53.

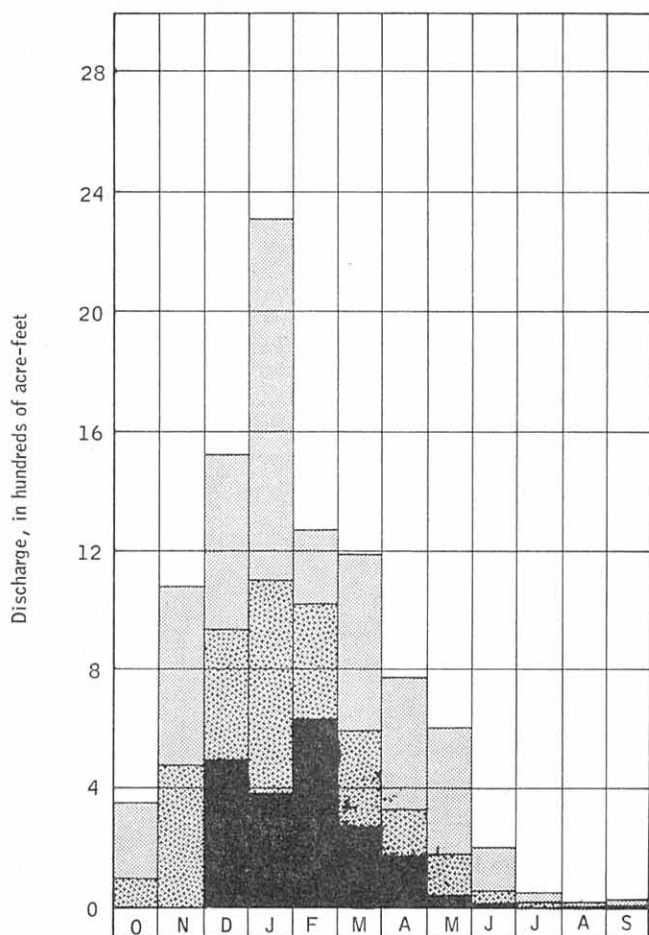


Figure 40. MAXIMUM, MINIMUM AND AVERAGE MONTHLY DISCHARGE FOR THE PERIOD 1945-53.

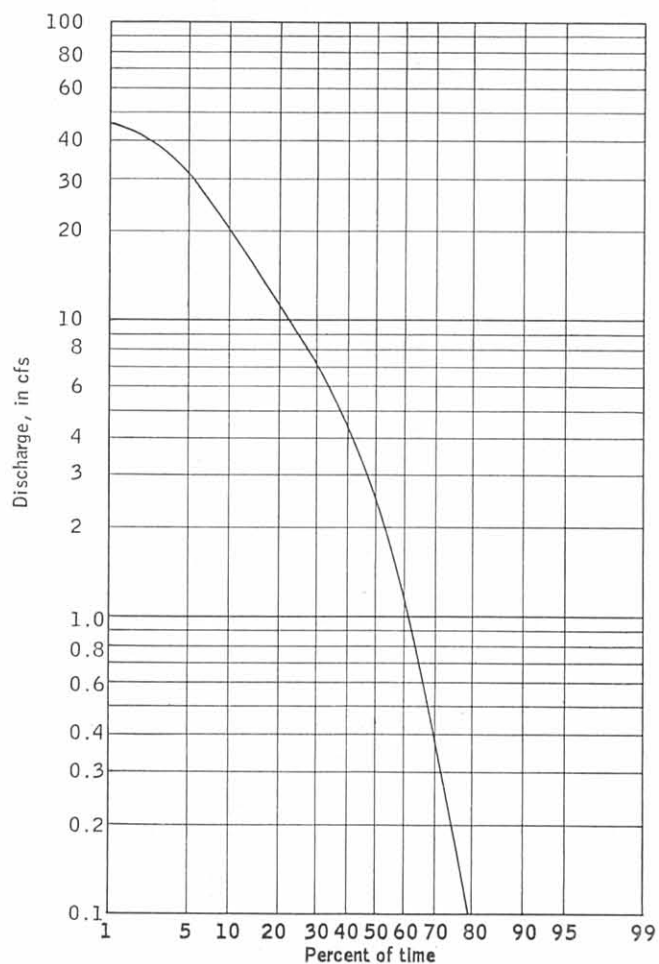


Figure 41. FLOW-DURATION CURVE FOR THE PERIOD 1946-53.

## MISSION CREEK NEAR BREMERTON

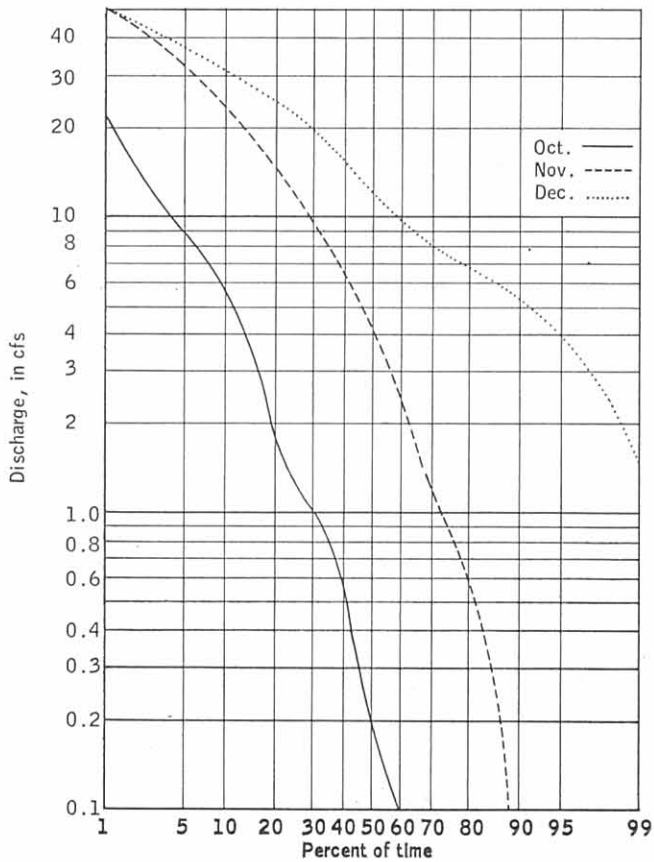


Figure 42a. FLOW-DURATION CURVES FOR OCTOBER, NOVEMBER, DECEMBER 1946-53.

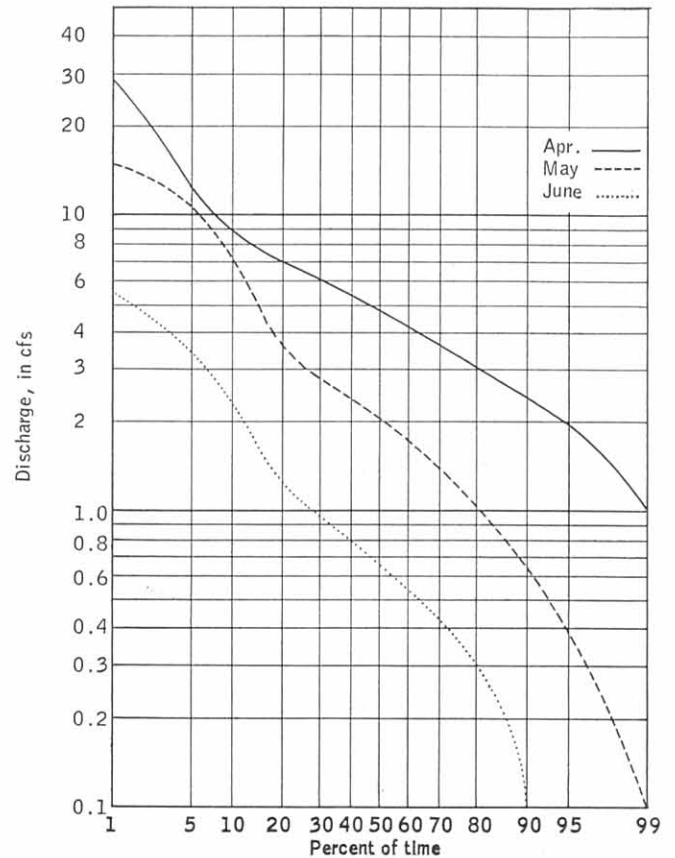


Figure 42b. FLOW-DURATION CURVES FOR JANUARY, FEBRUARY, MARCH 1946-53.

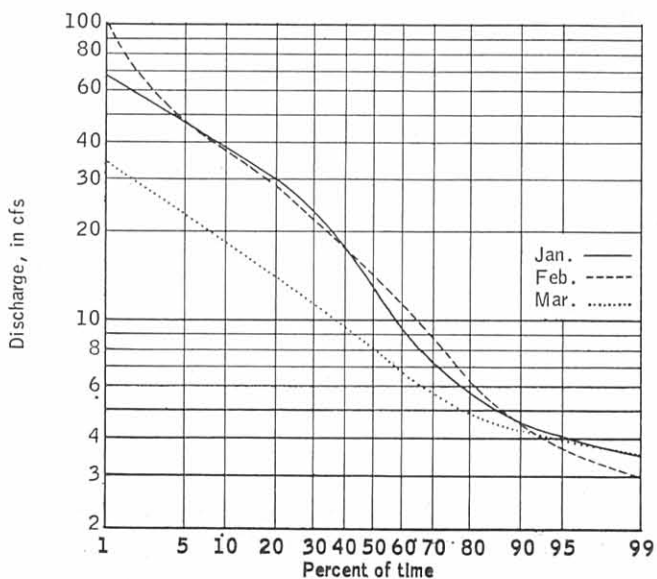


Figure 42c. FLOW-DURATION CURVES FOR APRIL, MAY, JUNE 1946-53.

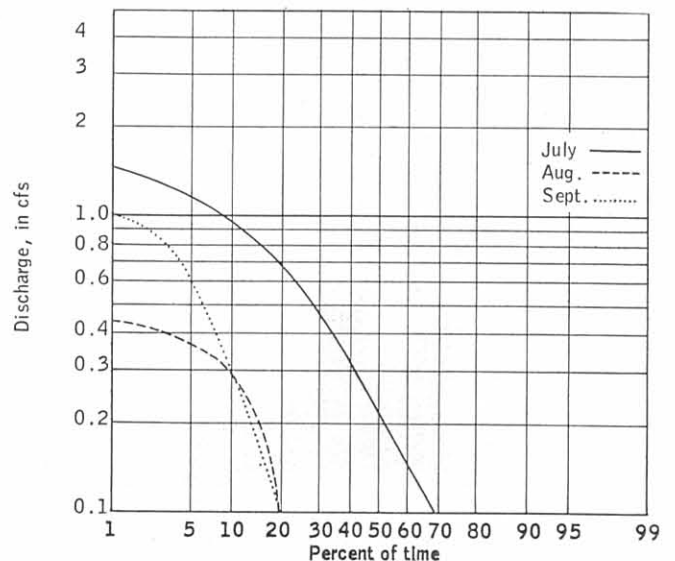


Figure 42d. FLOW-DURATION CURVES FOR JULY, AUGUST, SEPTEMBER 1946-53.

## MISSION CREEK NEAR BELFAIR

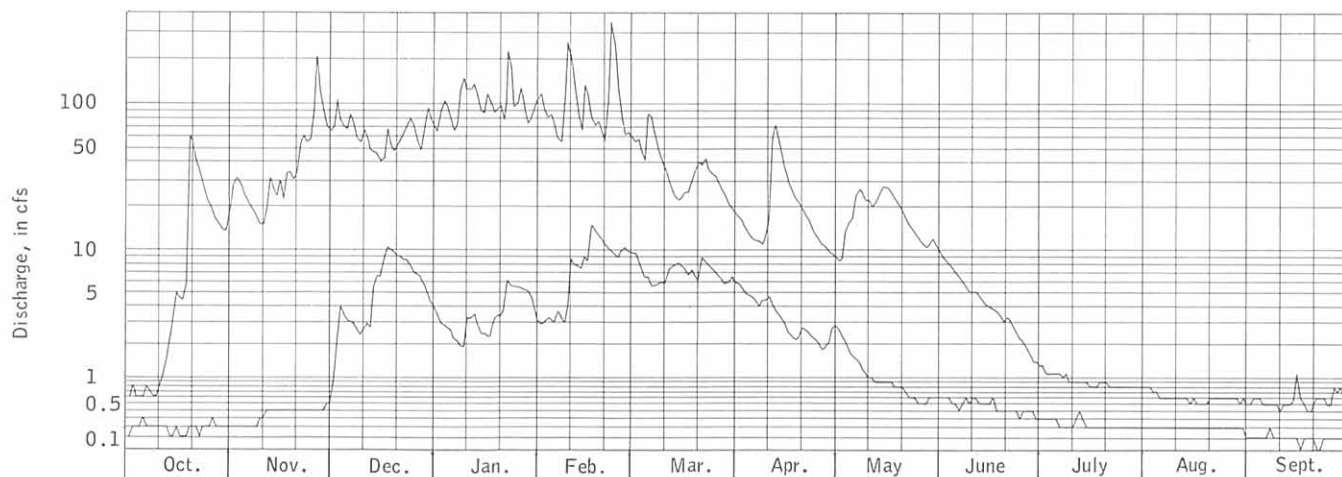


Figure 43. MAXIMUM-MINIMUM DISCHARGE HYDROGRAPHS FOR YEARS 1946-53.

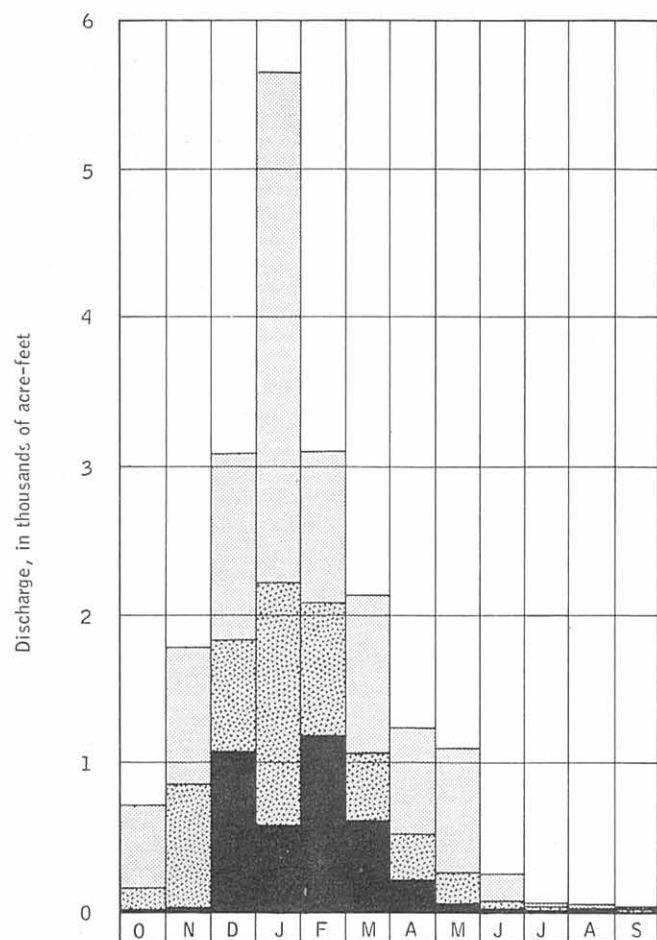


Figure 44. MAXIMUM, MINIMUM AND AVERAGE MONTHLY DISCHARGE FOR THE PERIOD 1946-53.

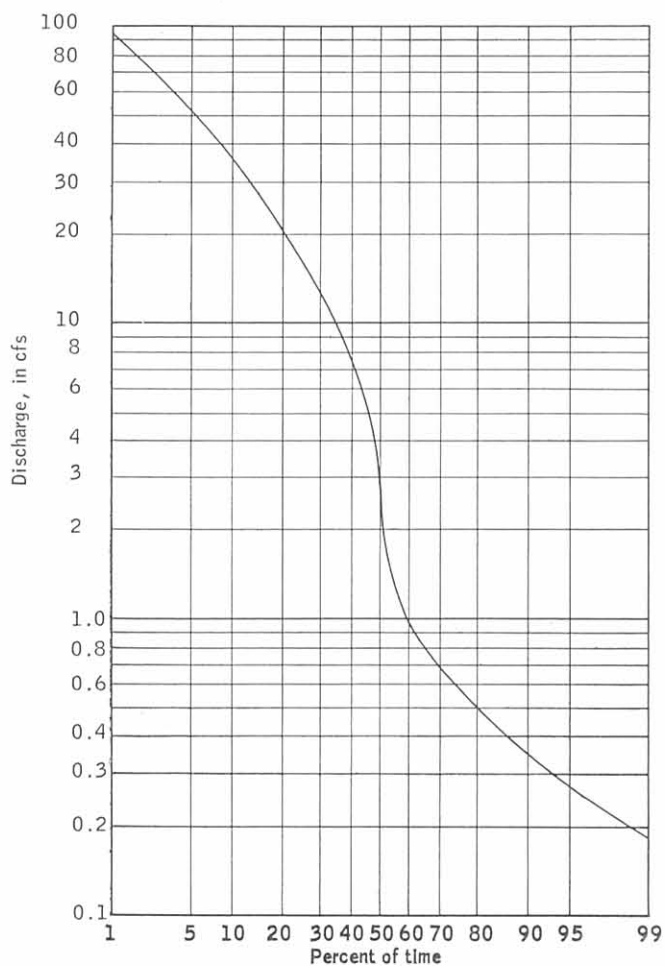


Figure 45. FLOW-DURATION CURVE FOR THE PERIOD 1946-53.

## MISSION CREEK NEAR BELFAIR

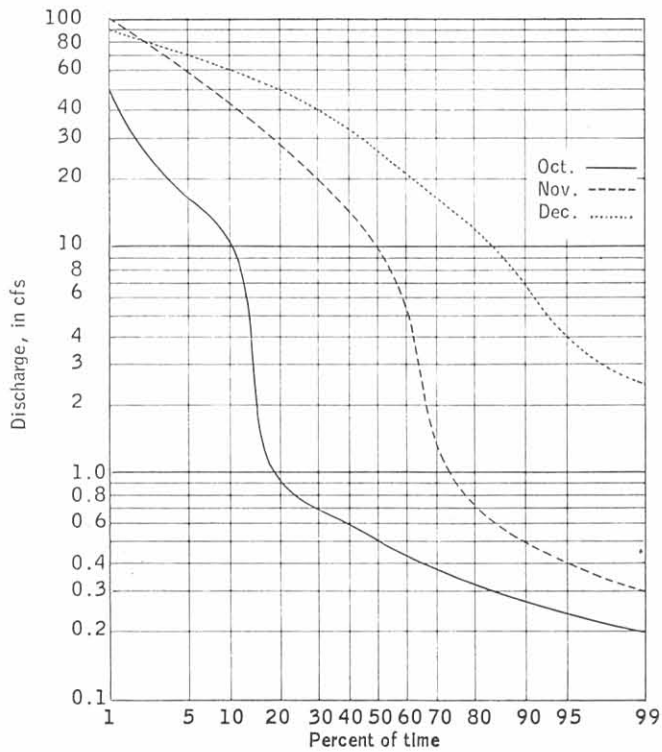


Figure 46a. FLOW-DURATION CURVES FOR OCTOBER, NOVEMBER, DECEMBER 1946-53.

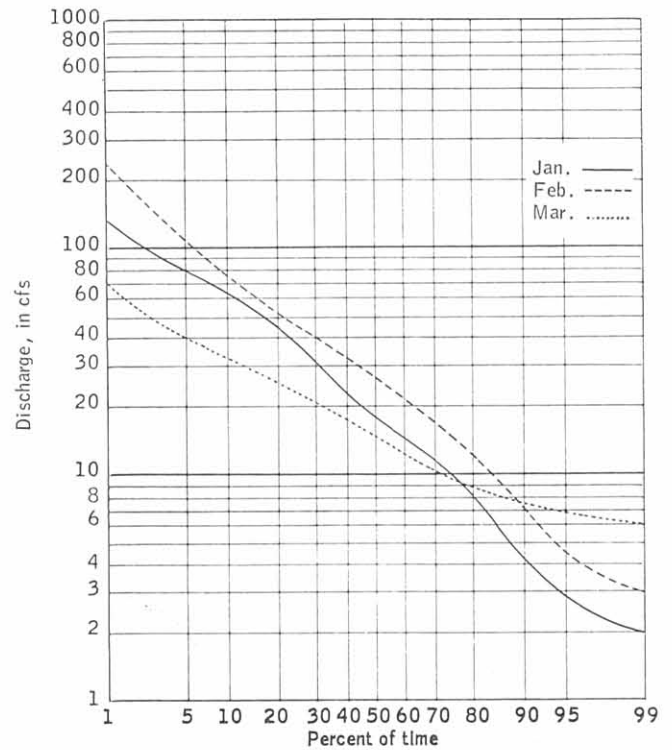


Figure 46b. FLOW-DURATION CURVES FOR JANUARY, FEBRUARY, MARCH 1946-53.

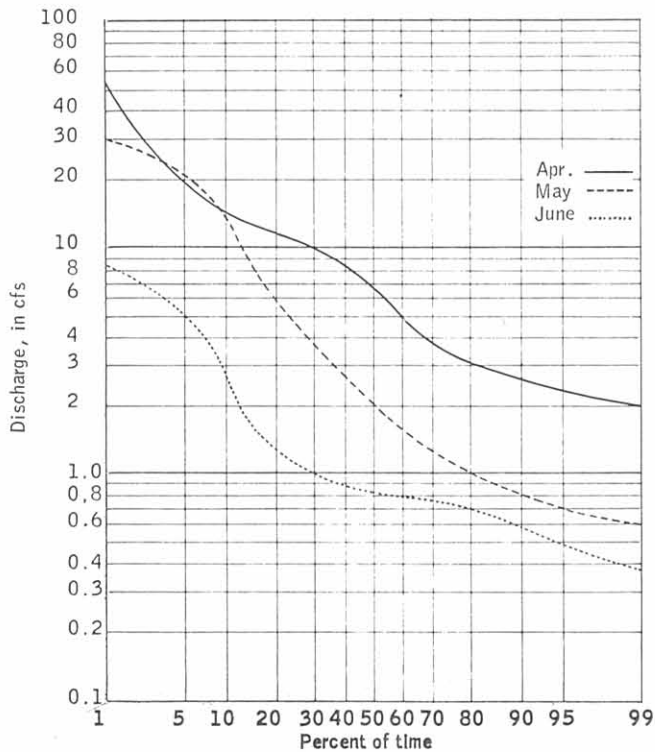


Figure 46c. FLOW-DURATION CURVES FOR APRIL, MAY, JUNE 1946-53.

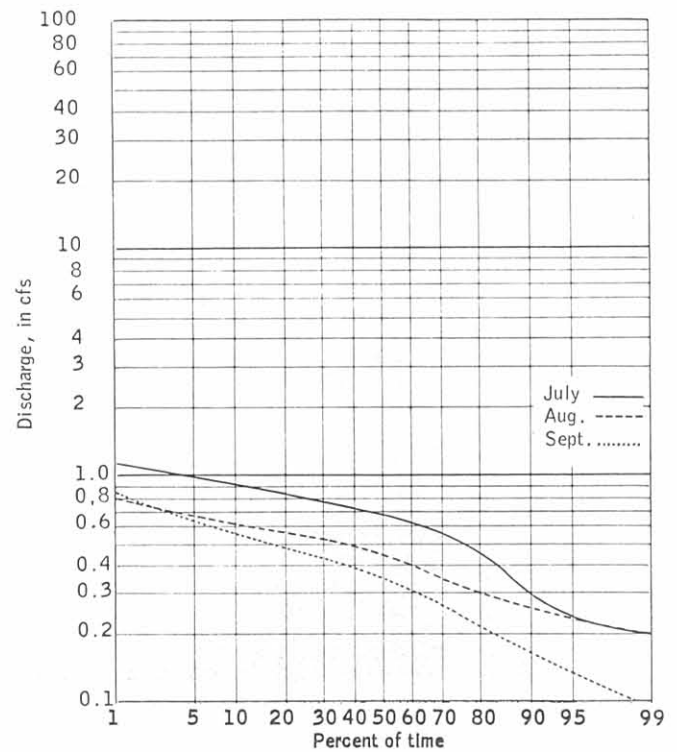


Figure 46d. FLOW-DURATION CURVES FOR JULY, AUGUST, SEPTEMBER 1946-53.



## GOLD CREEK NEAR BREMERTON

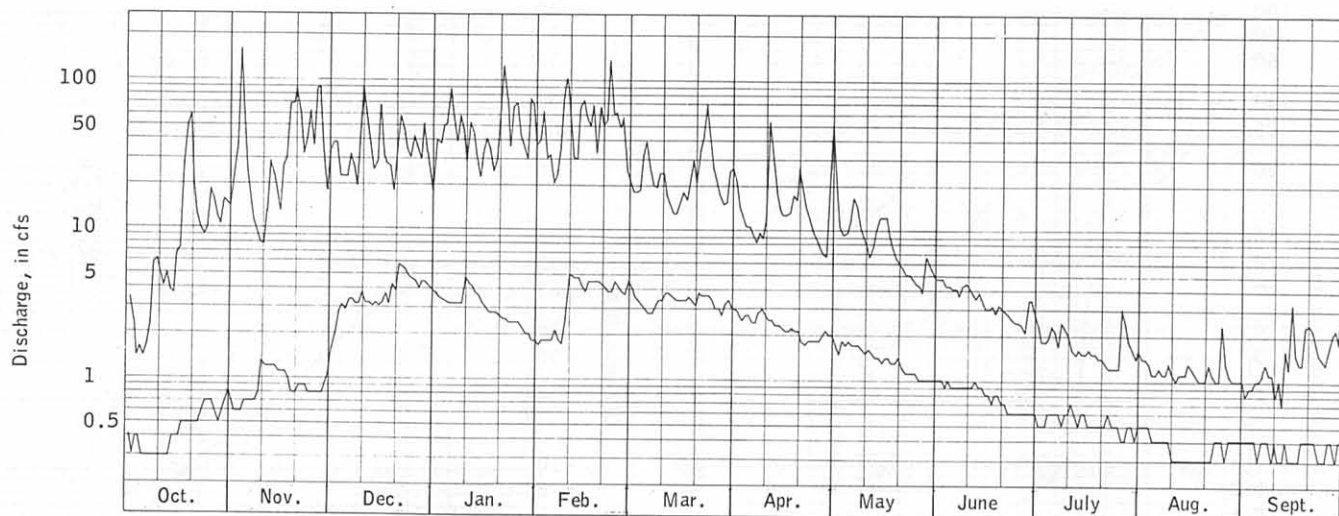


Figure 47. MAXIMUM-MINIMUM DISCHARGE HYDROGRAPHS FOR YEARS 1946-60.

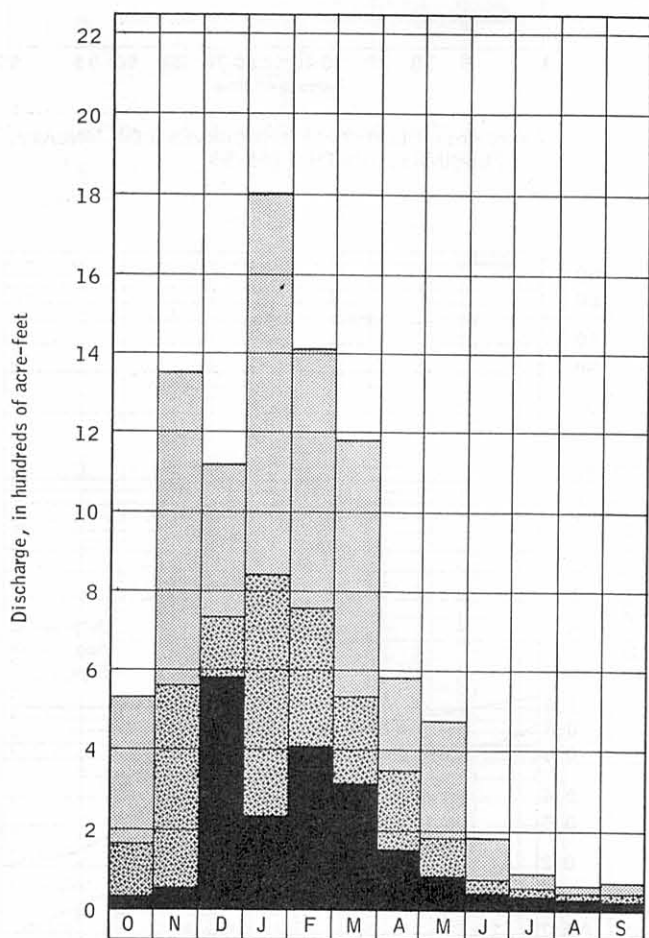


Figure 48. MAXIMUM, MINIMUM AND AVERAGE MONTHLY DISCHARGE FOR THE PERIOD 1946-60.

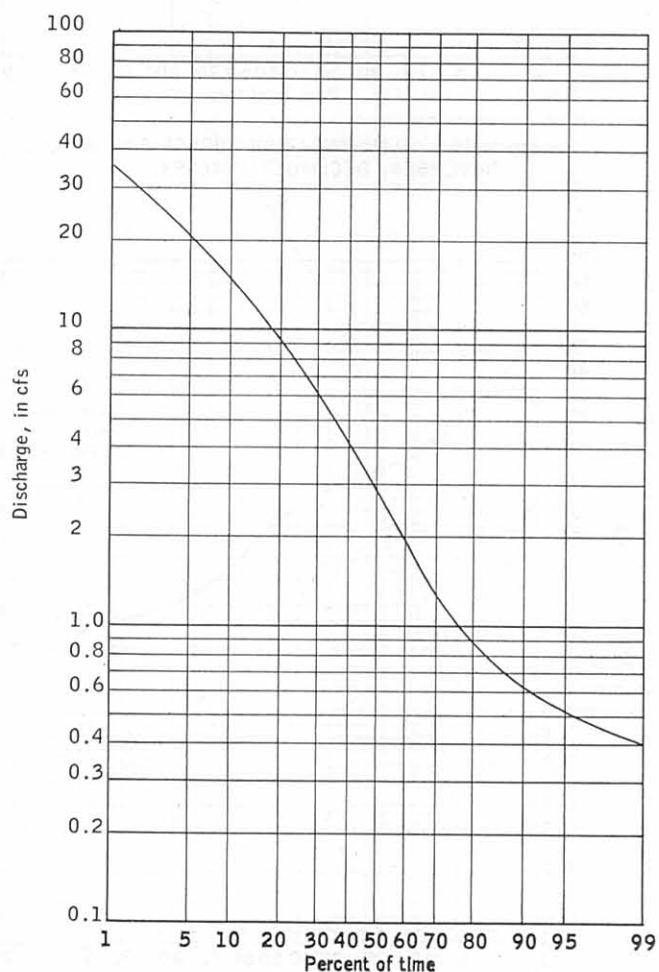


Figure 49. FLOW-DURATION CURVE FOR THE PERIOD 1946-60.



## GOLD CREEK NEAR BREMERTON

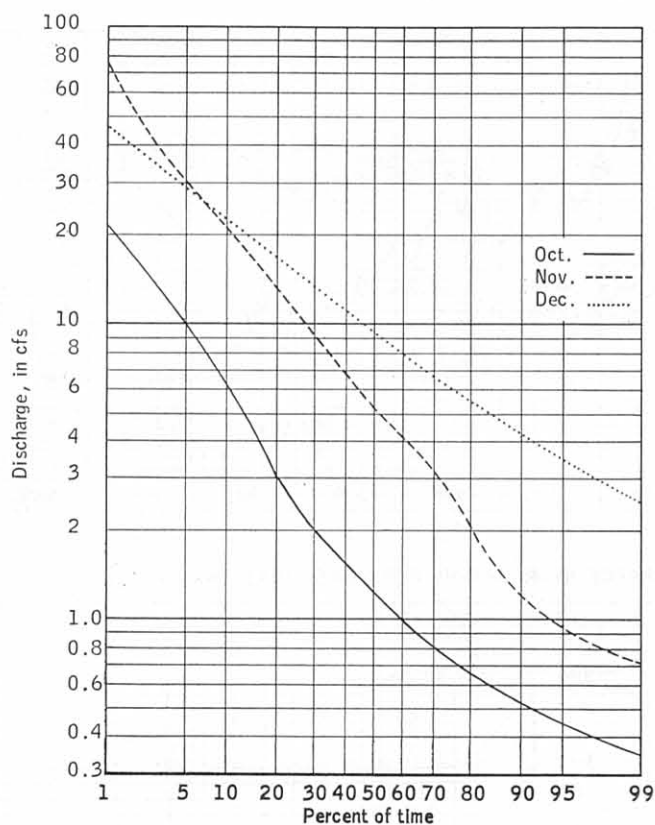


Figure 50a. FLOW-DURATION CURVES FOR OCTOBER, NOVEMBER, DECEMBER 1946-60.

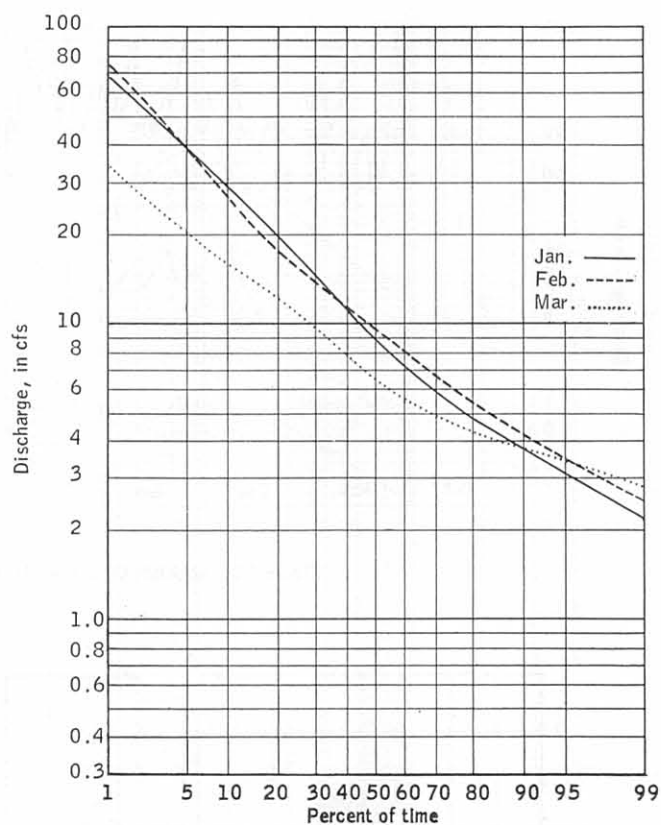


Figure 50b. FLOW-DURATION CURVES FOR JANUARY, FEBRUARY, MARCH 1946-60.

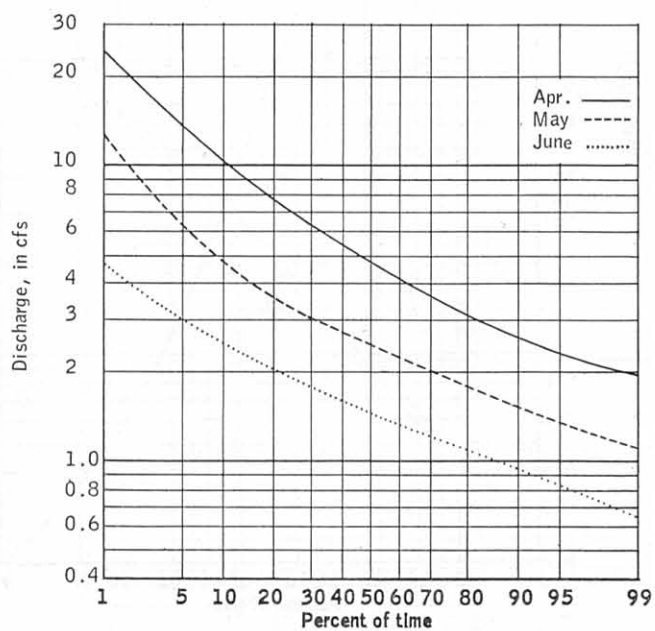


Figure 50c. FLOW-DURATION CURVES FOR APRIL, MAY, JUNE 1946-60.

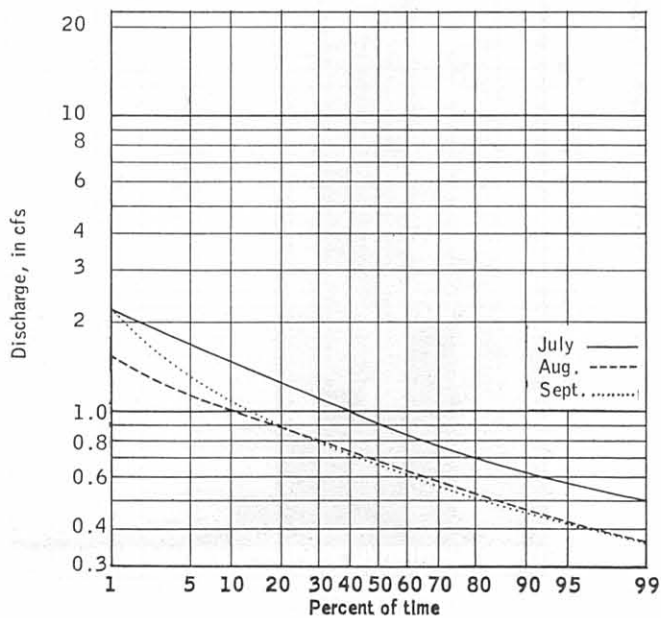


Figure 50d. FLOW-DURATION CURVES FOR JULY, AUGUST, SEPTEMBER 1946-60.

## TAHUYA RIVER NEAR BREMERTON

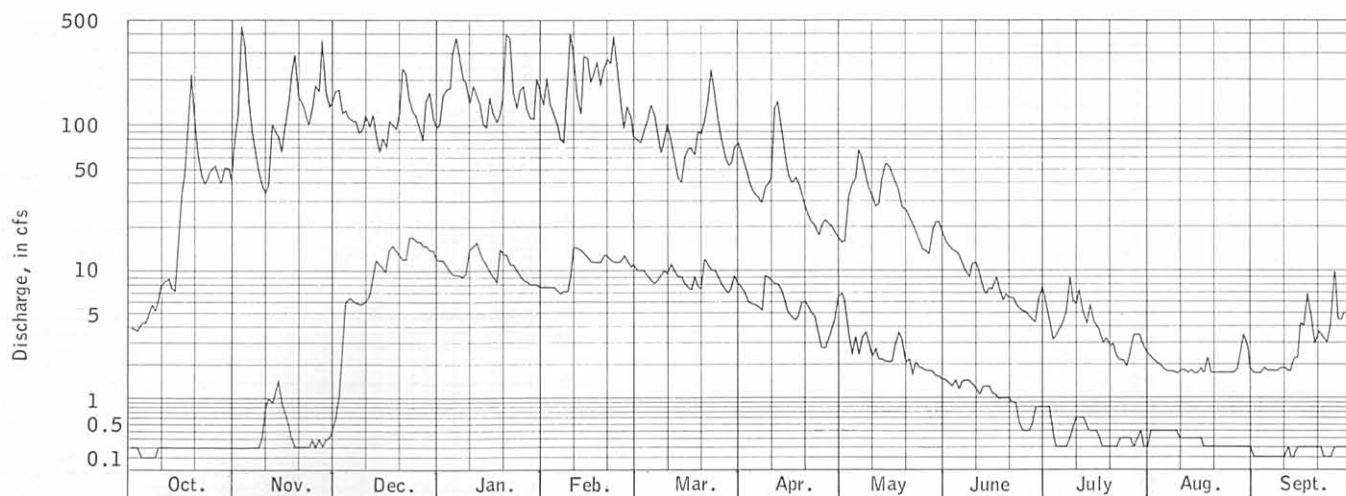


Figure 51. MAXIMUM-MINIMUM DISCHARGE HYDROGRAPHS FOR YEARS 1945-56.

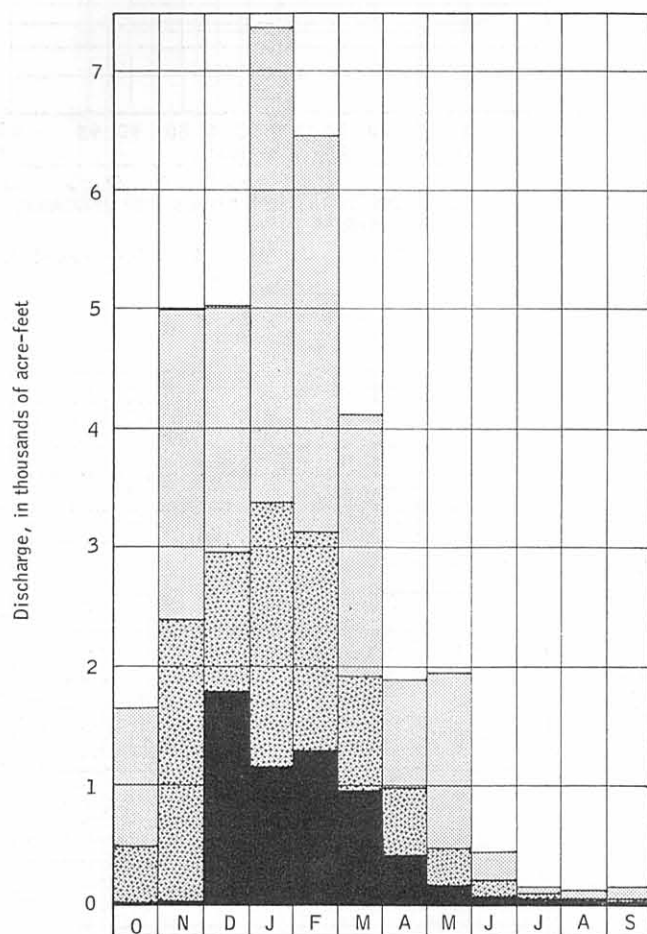


Figure 52. MAXIMUM, MINIMUM AND AVERAGE MONTHLY DISCHARGE FOR THE PERIOD 1945-56.

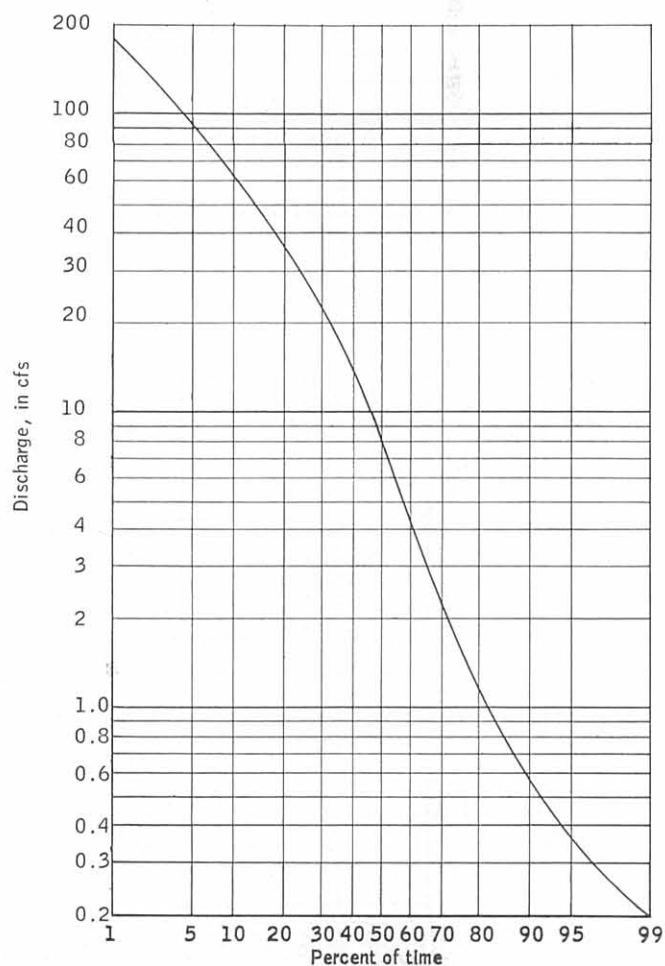


Figure 53. FLOW-DURATION CURVE FOR THE PERIOD 1946-56.

## TAHUYA RIVER NEAR BREMERTON

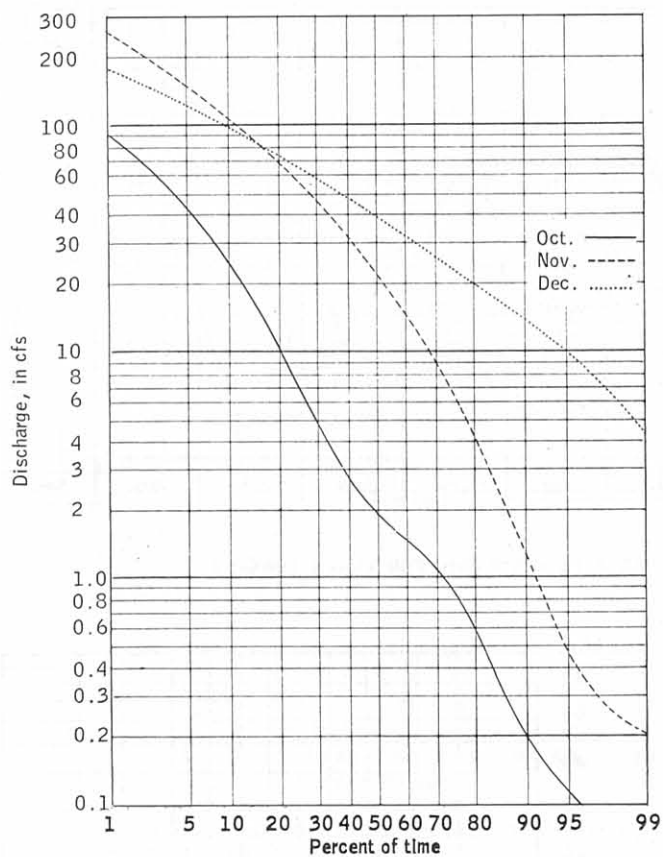


Figure 54a. FLOW-DURATION CURVES FOR OCTOBER, NOVEMBER, DECEMBER 1946-56.

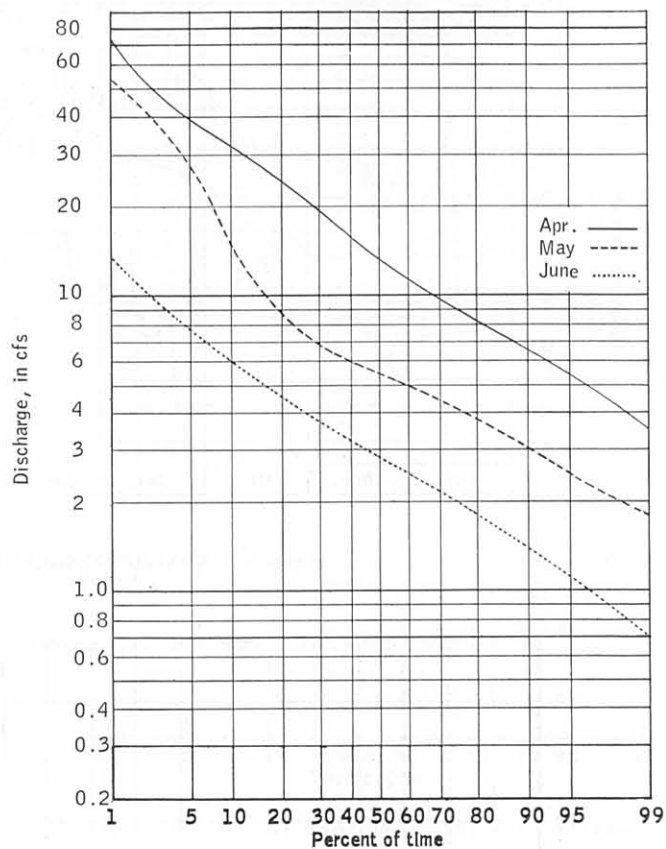


Figure 54b. FLOW-DURATION CURVES FOR JANUARY, FEBRUARY, MARCH 1946-56.

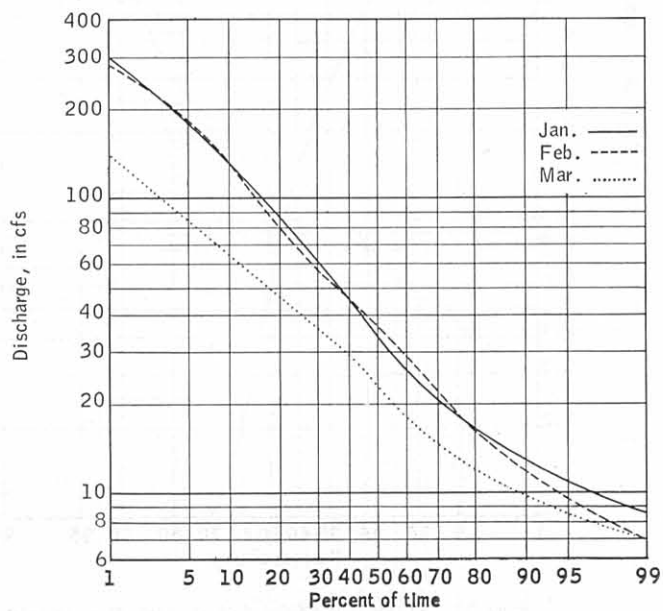


Figure 54c. FLOW-DURATION CURVES FOR APRIL, MAY, JUNE 1946-56.

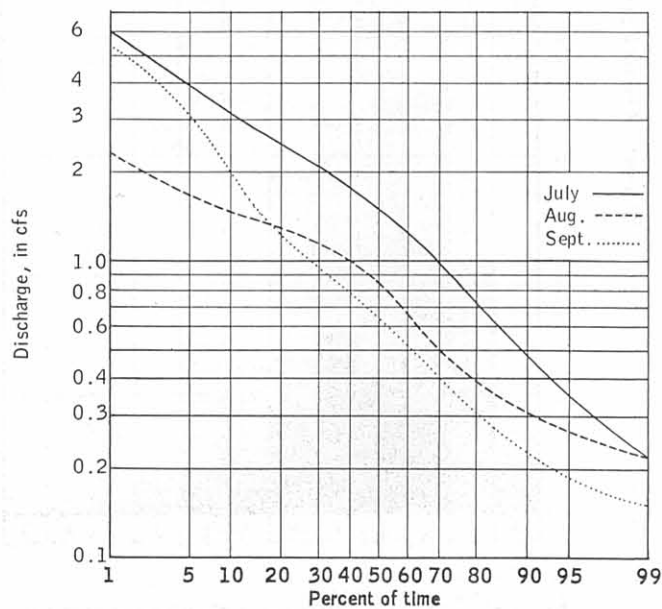


Figure 54d. FLOW-DURATION CURVES FOR JULY, AUGUST, SEPTEMBER 1946-56.

## PANTHER CREEK NEAR BREMERTON

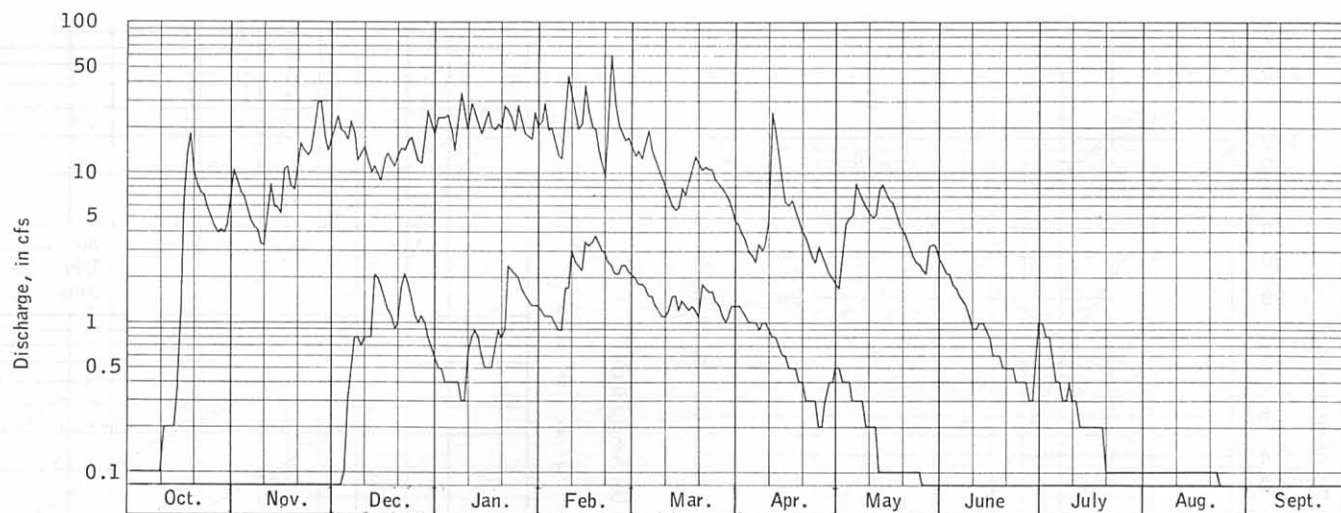


Figure 55. MAXIMUM-MINIMUM DISCHARGE HYDROGRAPHS FOR YEARS 1945-53.

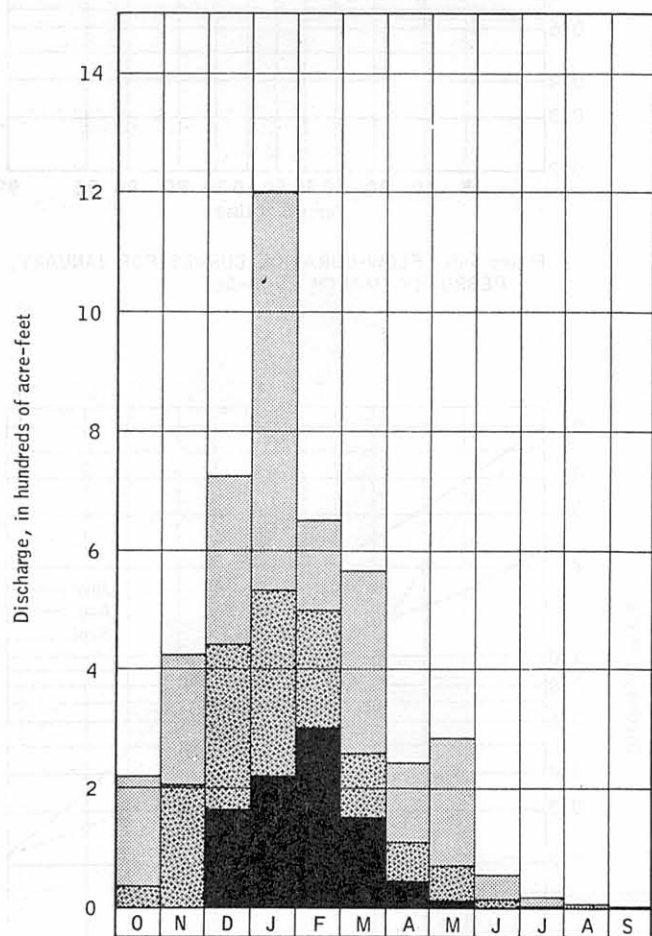


Figure 56. MAXIMUM, MINIMUM AND AVERAGE MONTHLY DISCHARGE FOR THE PERIOD 1945-53.

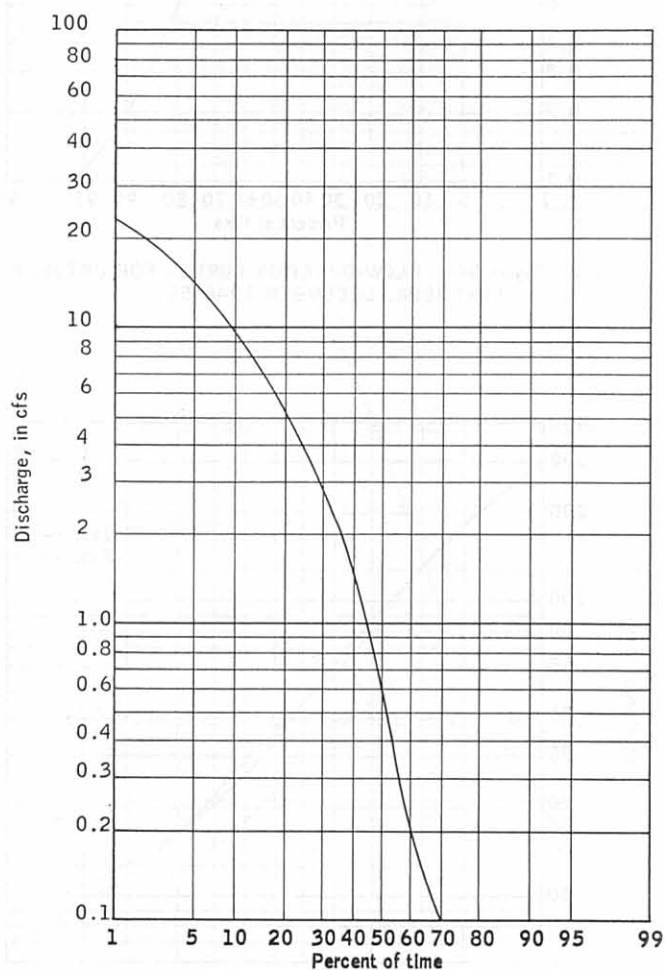


Figure 57. FLOW-DURATION CURVE FOR THE PERIOD 1946-53.

## PANTHER CREEK NEAR BREMERTON

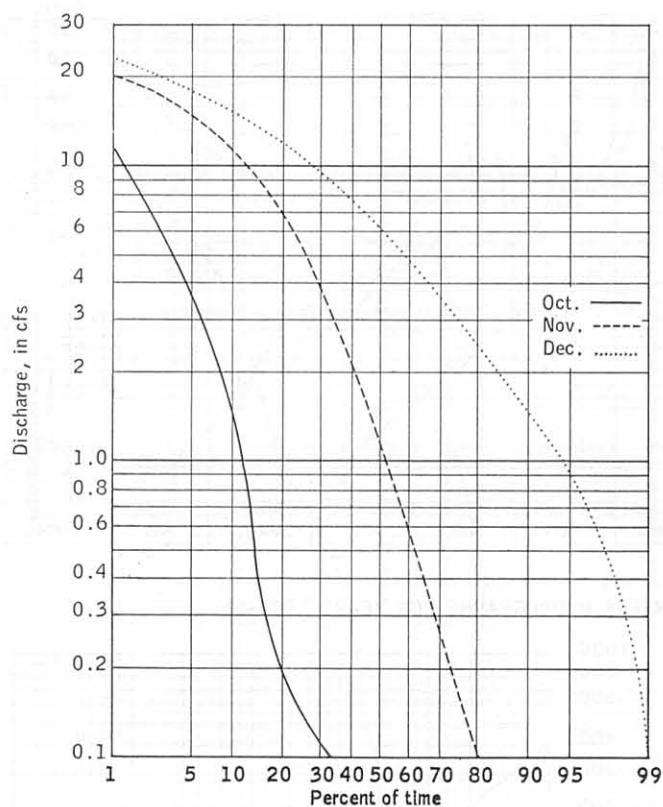


Figure 58a. FLOW-DURATION CURVES FOR OCTOBER, NOVEMBER, DECEMBER 1946-53.

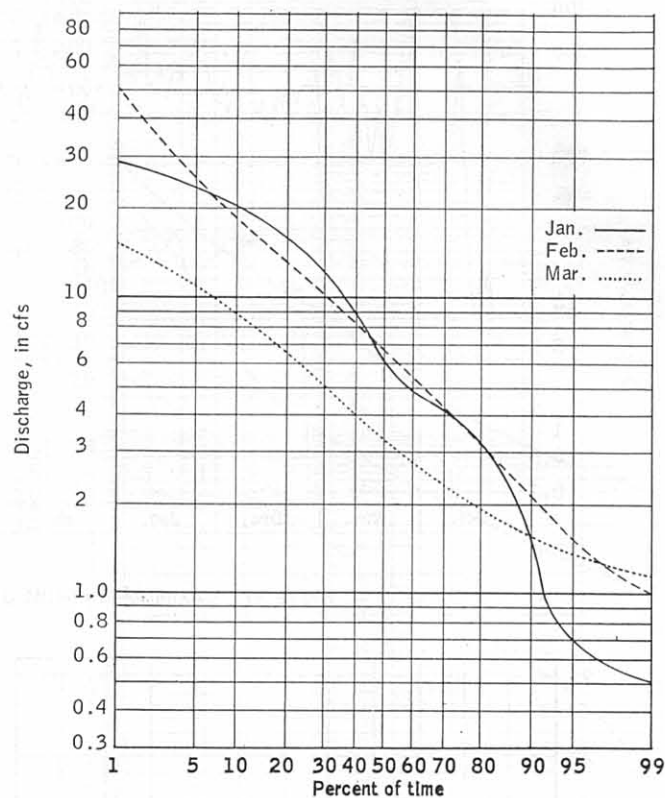


Figure 58b. FLOW-DURATION CURVES FOR JANUARY, FEBRUARY, MARCH 1946-53.

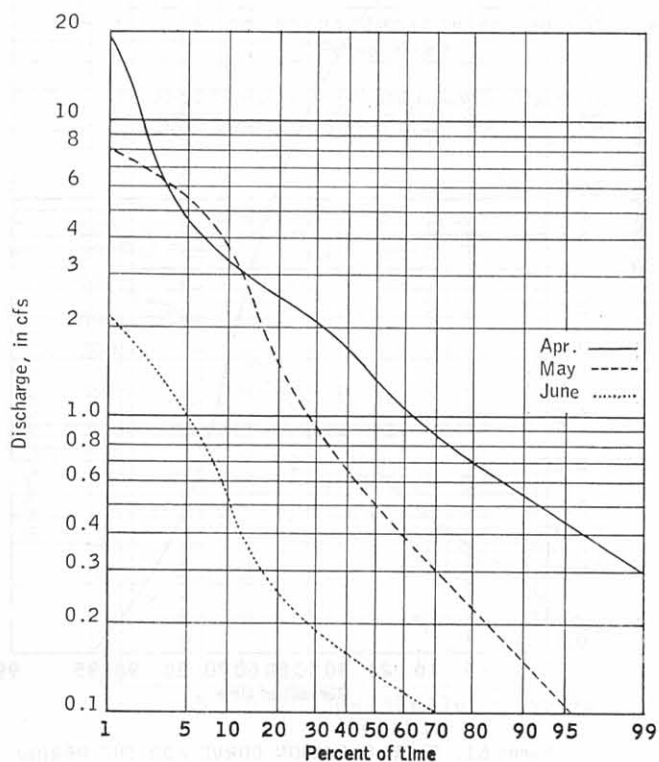


Figure 58c. FLOW-DURATION CURVES FOR APRIL, MAY, JUNE 1946-53.

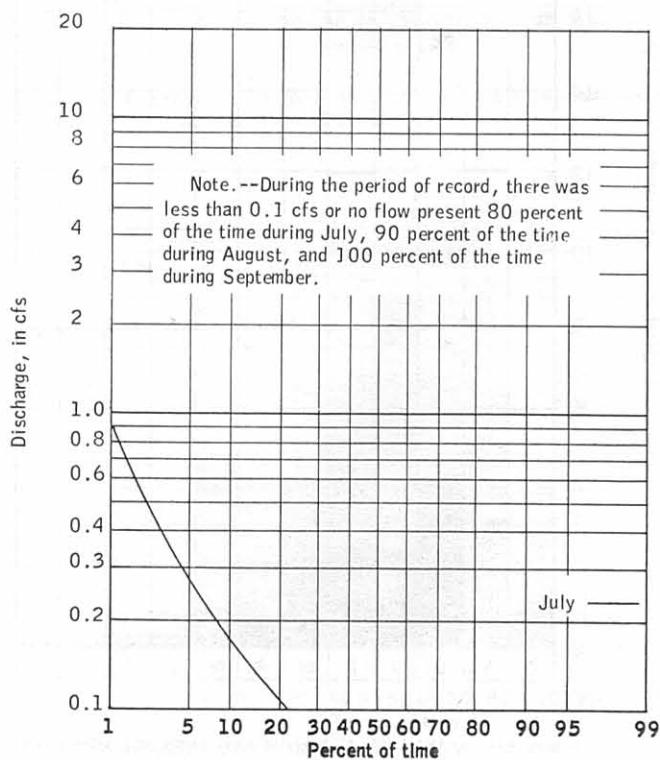


Figure 58d. FLOW-DURATION CURVES FOR JULY, AUGUST, SEPTEMBER 1946-53.



## TAHUYA RIVER NEAR BELFAIR

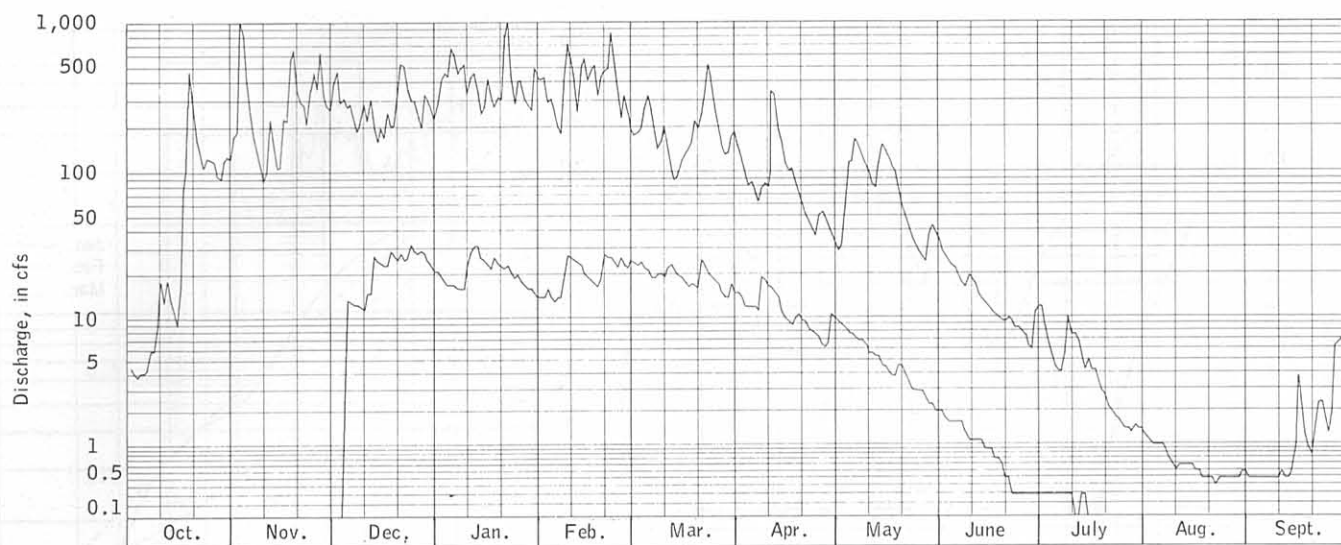


Figure 59. MAXIMUM-MINIMUM DISCHARGE HYDROGRAPHS FOR YEARS 1945-56.

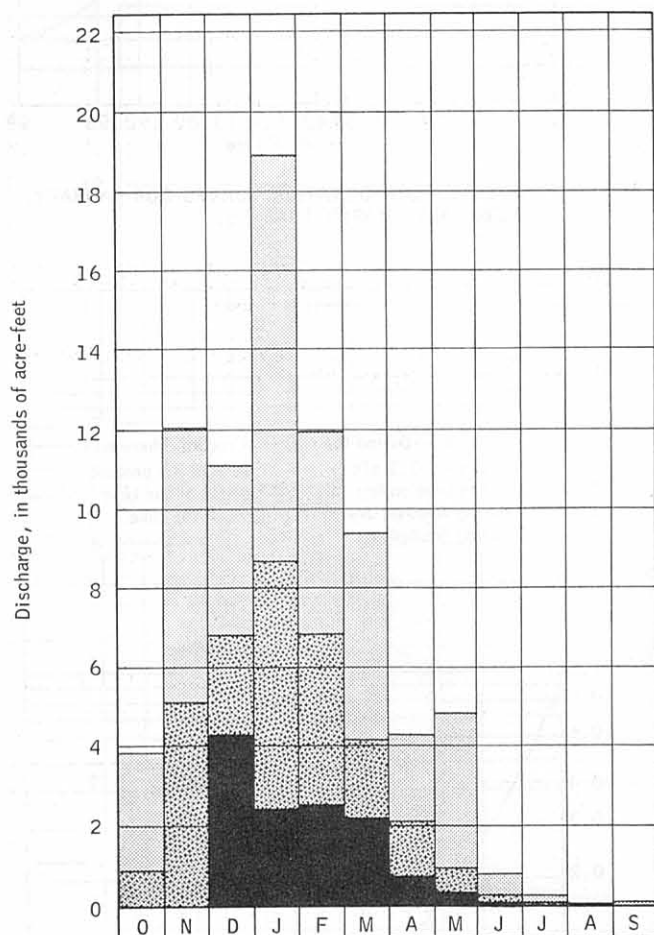


Figure 60. MAXIMUM, MINIMUM AND AVERAGE MONTHLY DISCHARGE FOR THE PERIOD 1945-56.

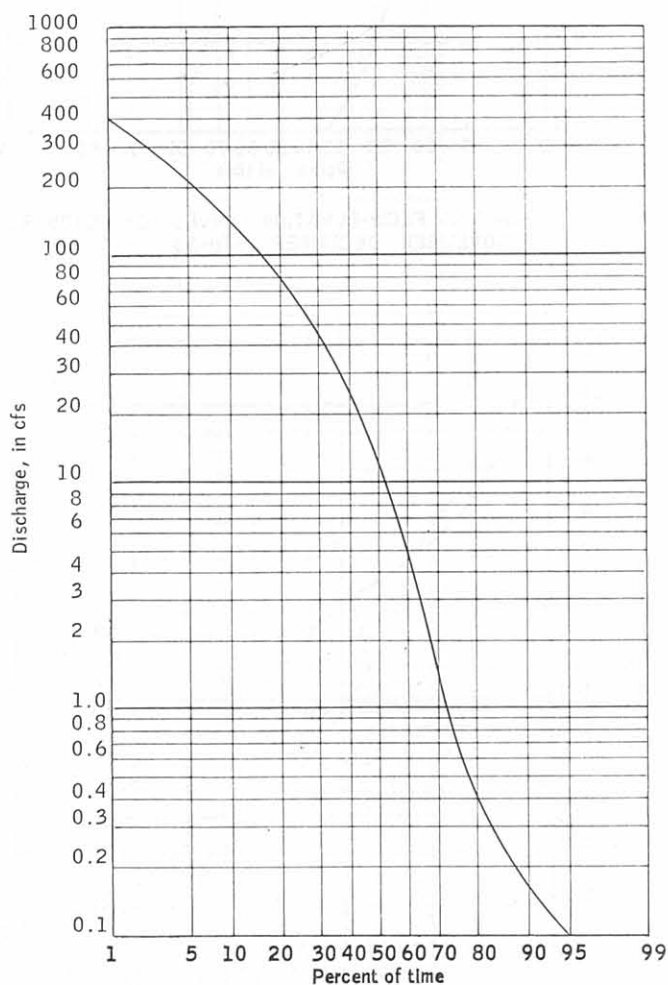


Figure 61. FLOW-DURATION CURVE FOR THE PERIOD 1946-56.

## TAHUYA RIVER NEAR BELFAIR

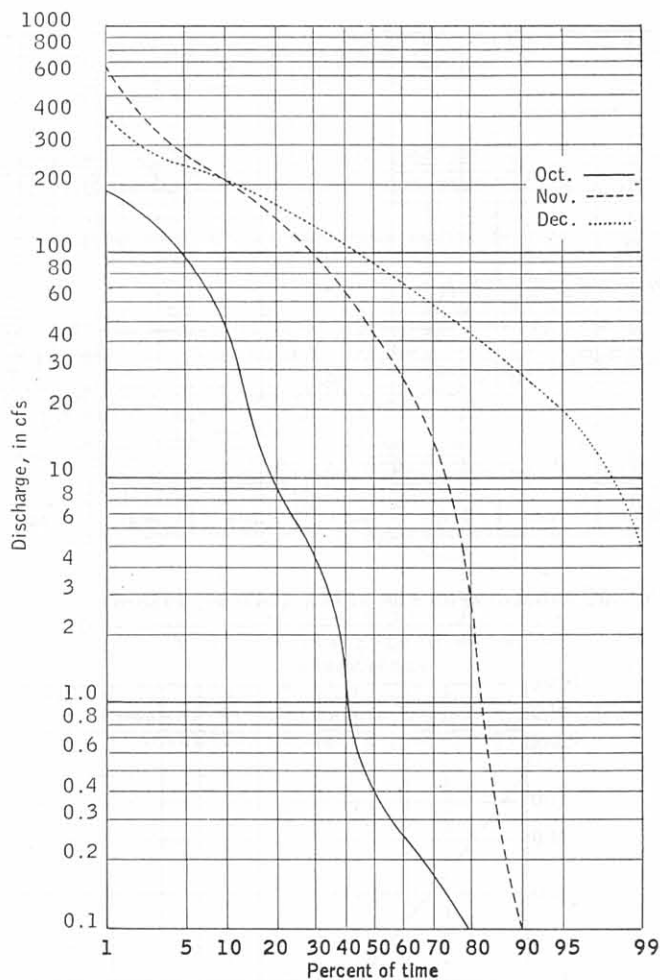


Figure 62a. FLOW-DURATION CURVES FOR OCTOBER, NOVEMBER, DECEMBER 1946-56.

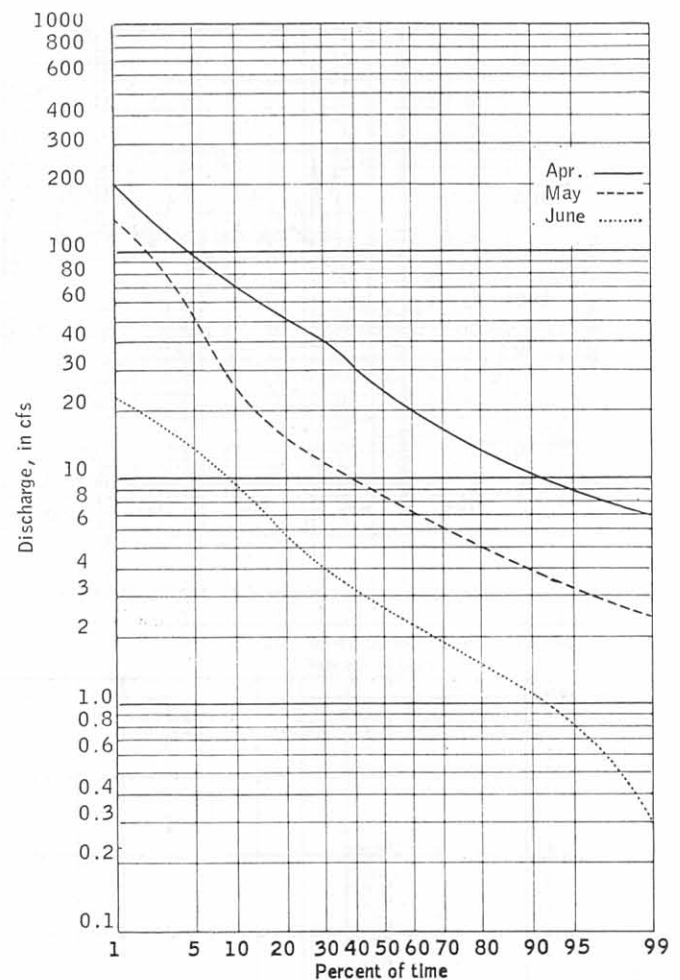


Figure 62b. FLOW-DURATION CURVES FOR JANUARY, FEBRUARY, MARCH 1946-56.

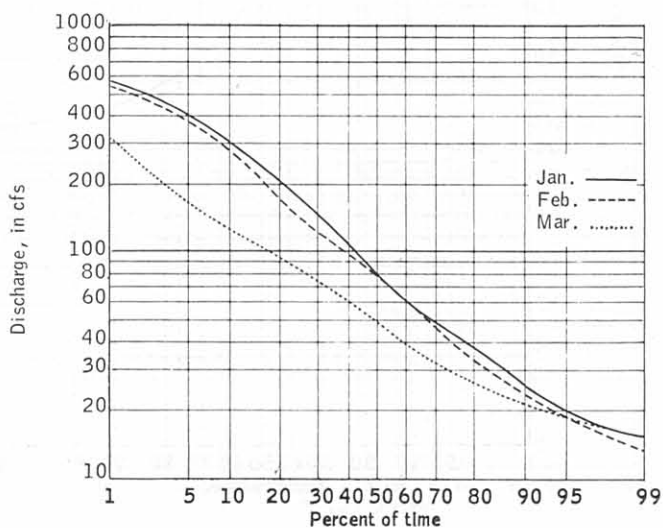


Figure 62c. FLOW-DURATION CURVES FOR APRIL, MAY, JUNE 1946-56.

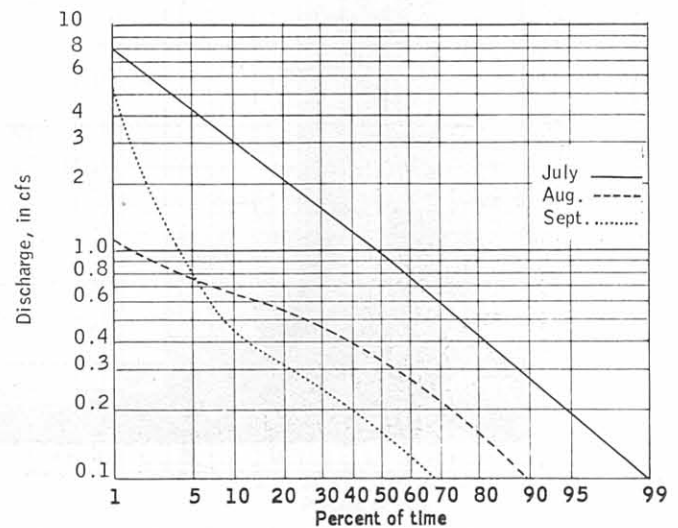


Figure 62d. FLOW-DURATION CURVES FOR JULY, AUGUST, SEPTEMBER 1946-56.

## DEWATTO CREEK NEAR DEWATTO

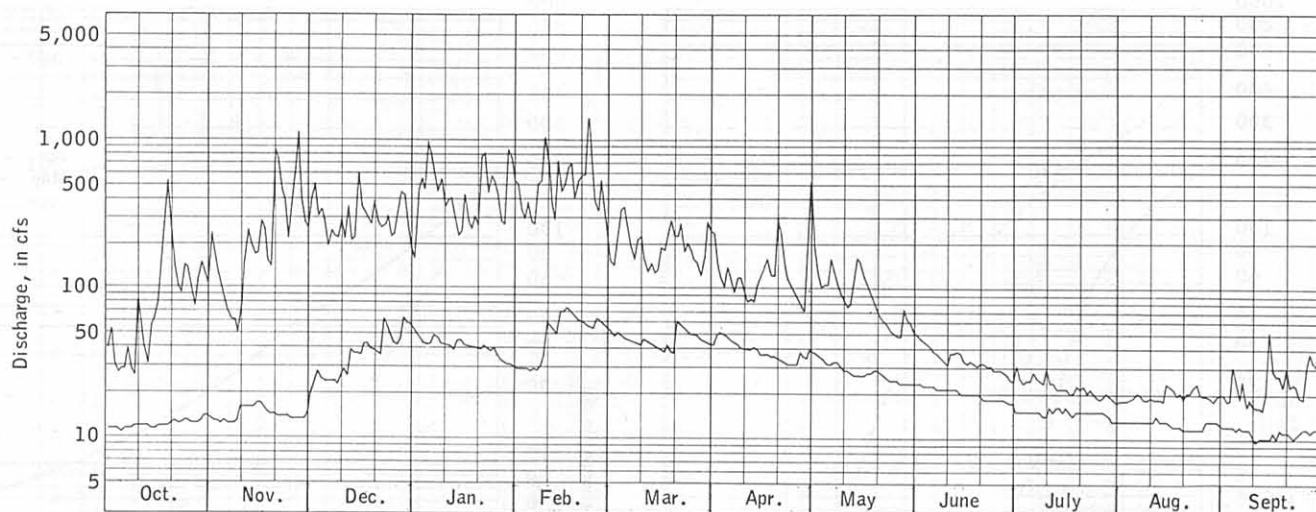


Figure 63. MAXIMUM-MINIMUM DISCHARGE HYDROGRAPHS FOR YEARS 1947-54, 1958-60.

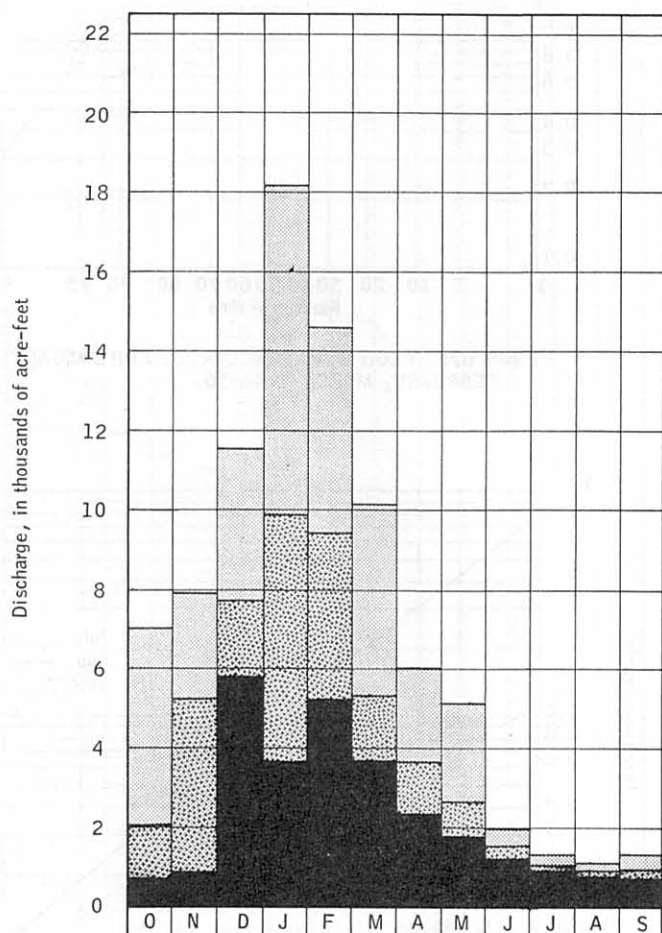


Figure 64. MAXIMUM, MINIMUM AND AVERAGE MONTHLY DISCHARGE FOR THE PERIOD 1947-54, 1958-60.

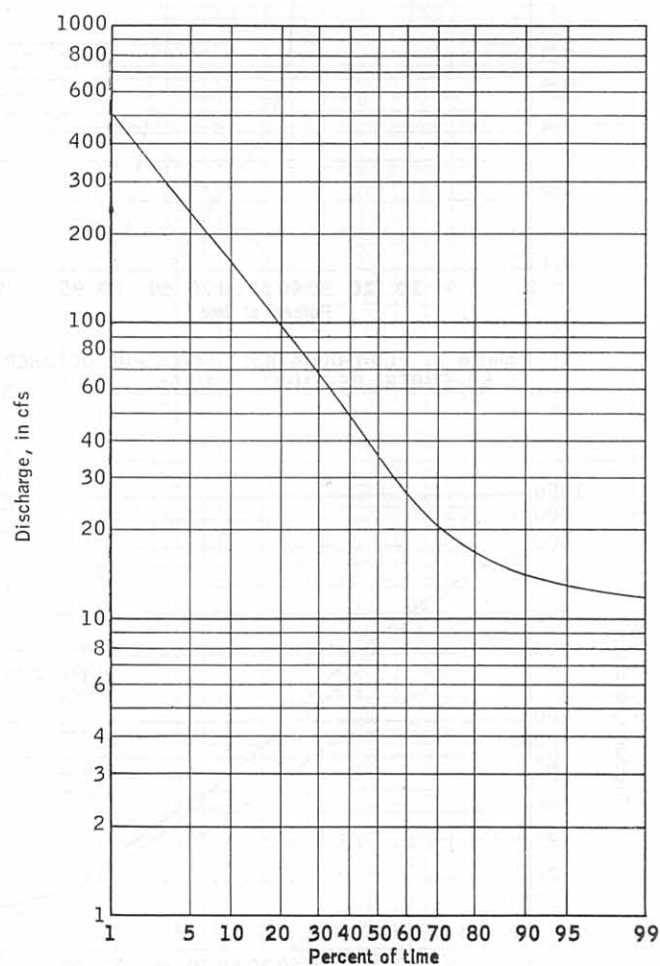


Figure 65. FLOW-DURATION CURVE FOR THE PERIOD 1948-54, 1959-60.



## DEWATTO CREEK NEAR DEWATTO

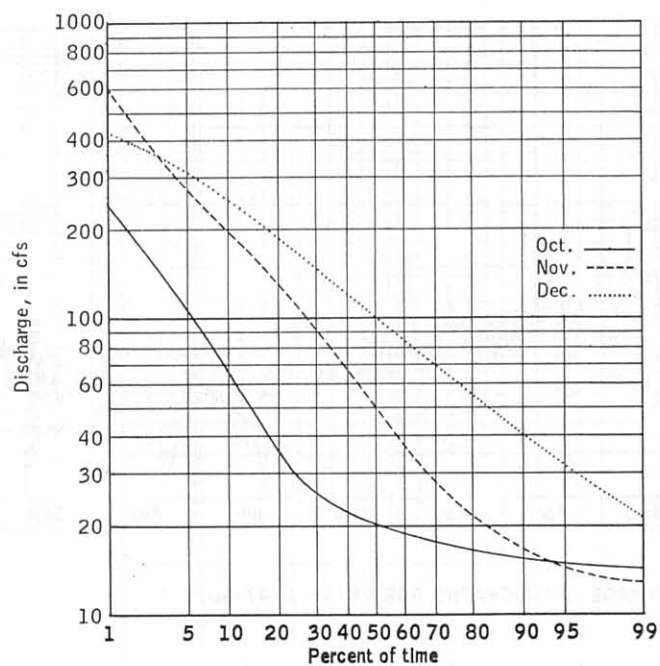


Figure 66a. FLOW-DURATION CURVES FOR OCTOBER, NOVEMBER, DECEMBER 1948-54, 1959-60.

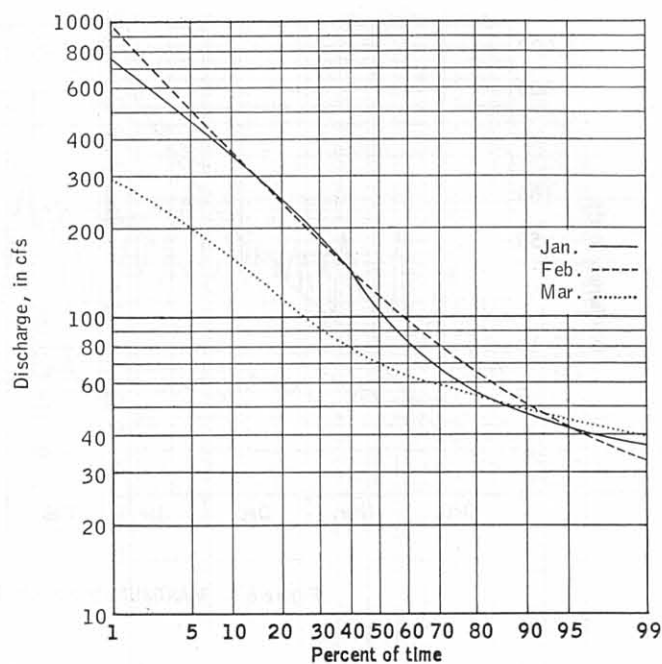


Figure 66b. FLOW-DURATION CURVES FOR JANUARY, FEBRUARY, MARCH 1948-54, 1959-60.

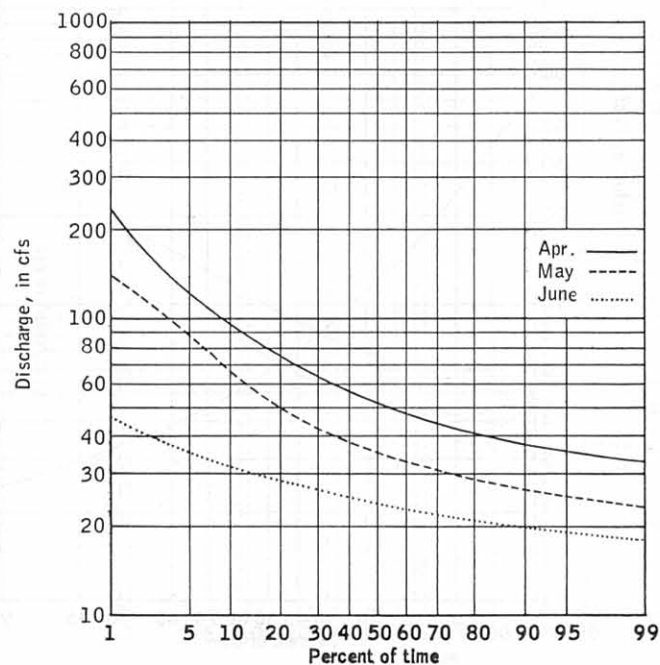


Figure 66c. FLOW-DURATION CURVES FOR APRIL, MAY, JUNE 1948-54, 1959-60.

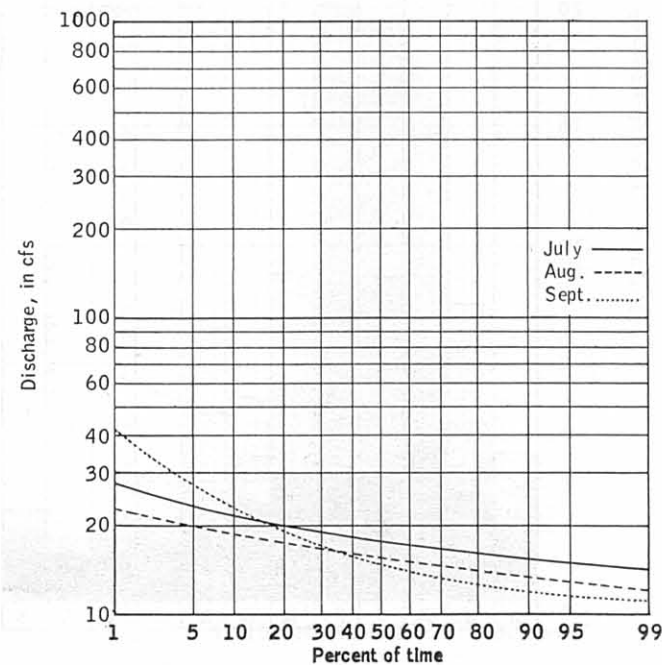


Figure 66d. FLOW-DURATION CURVES FOR JULY, AUGUST, SEPTEMBER 1948-54, 1959-60.

## DOGFISH CREEK NEAR POULSB0

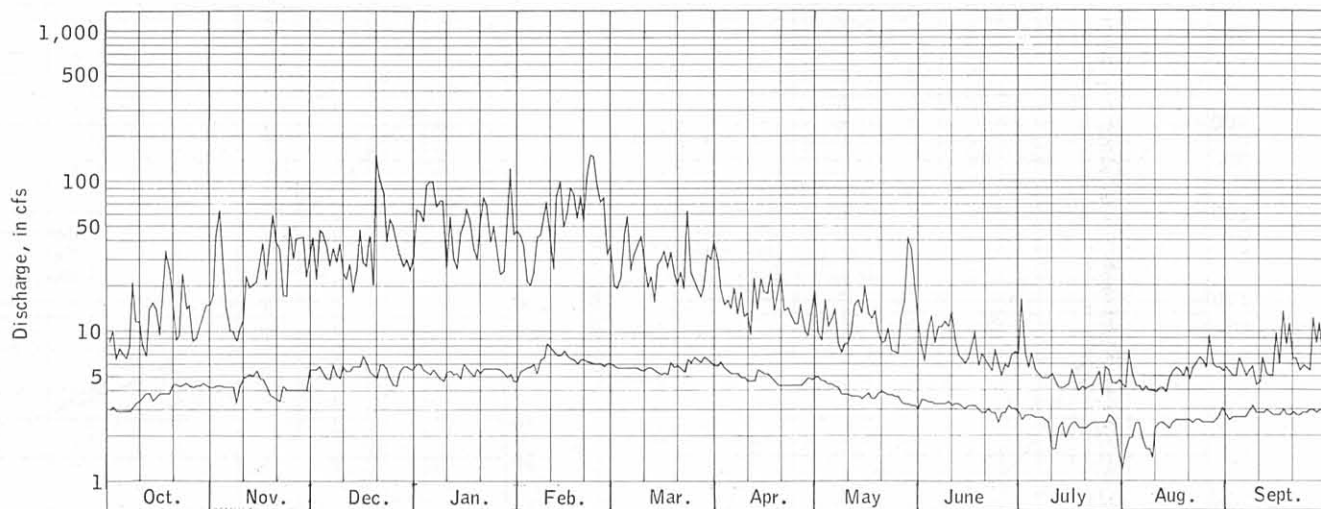


Figure 67. MAXIMUM-MINIMUM DISCHARGE HYDROGRAPHS FOR YEARS 1947-60.

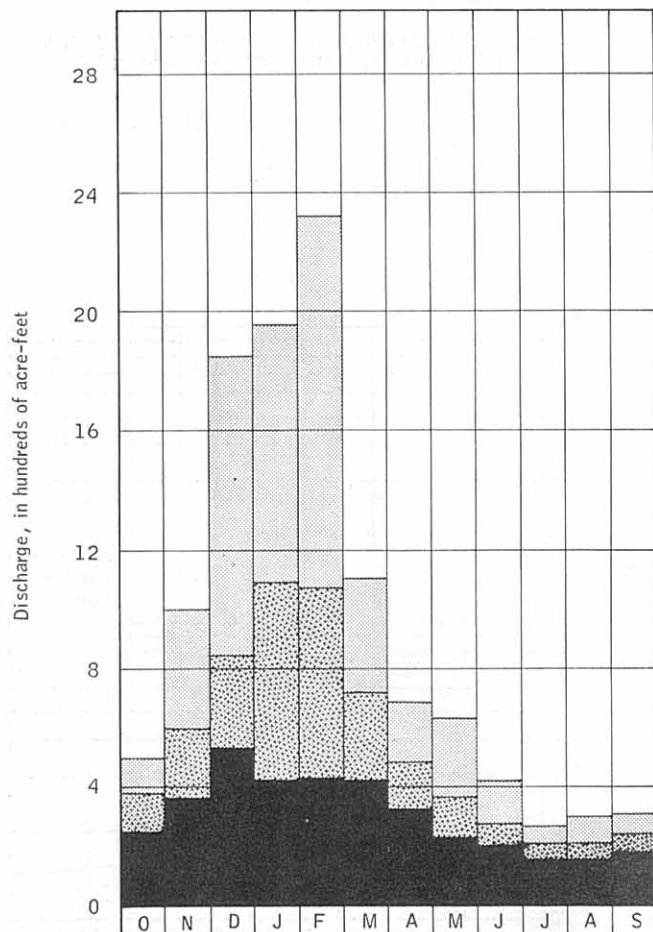


Figure 68. MAXIMUM, MINIMUM AND AVERAGE MONTHLY DISCHARGE FOR THE PERIOD 1947-60.

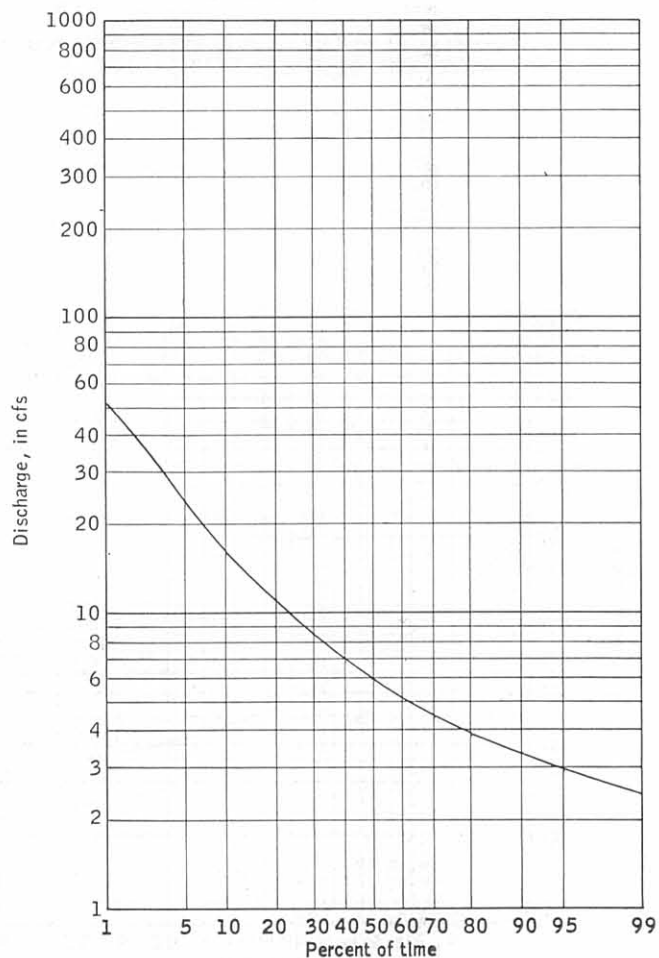


Figure 69. FLOW-DURATION CURVE FOR THE PERIOD 1948-60.

## DOGFISH CREEK NEAR POULSBORO

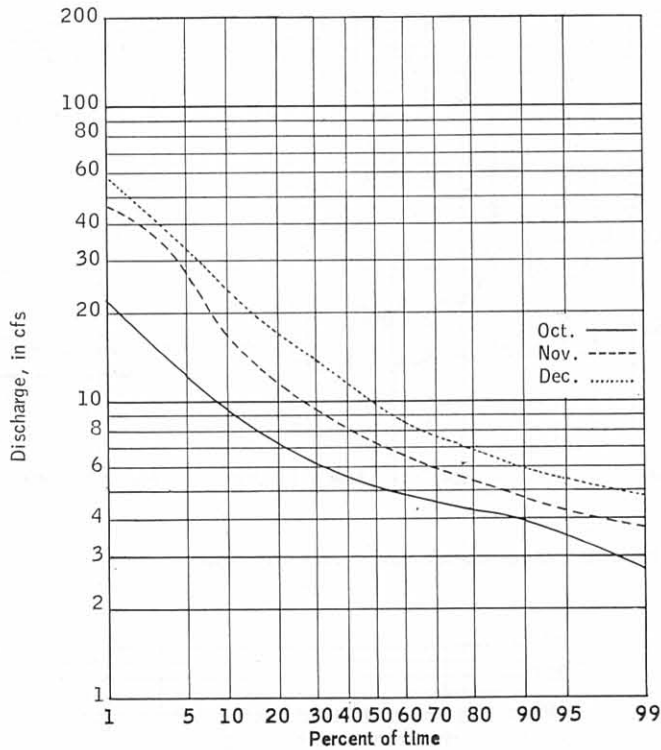


Figure 70a. FLOW-DURATION CURVES FOR OCTOBER, NOVEMBER, DECEMBER 1948-60.

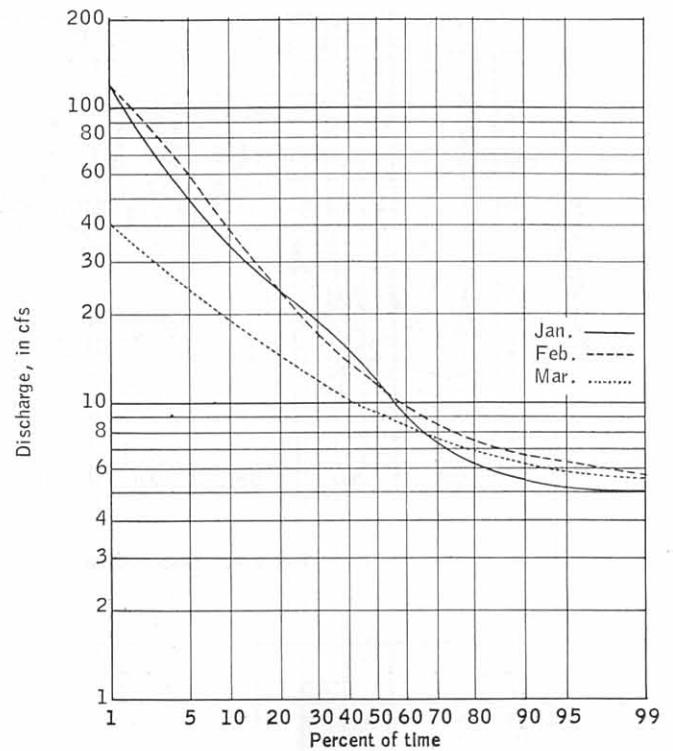


Figure 70b. FLOW-DURATION CURVES FOR JANUARY, FEBRUARY, MARCH 1948-60.

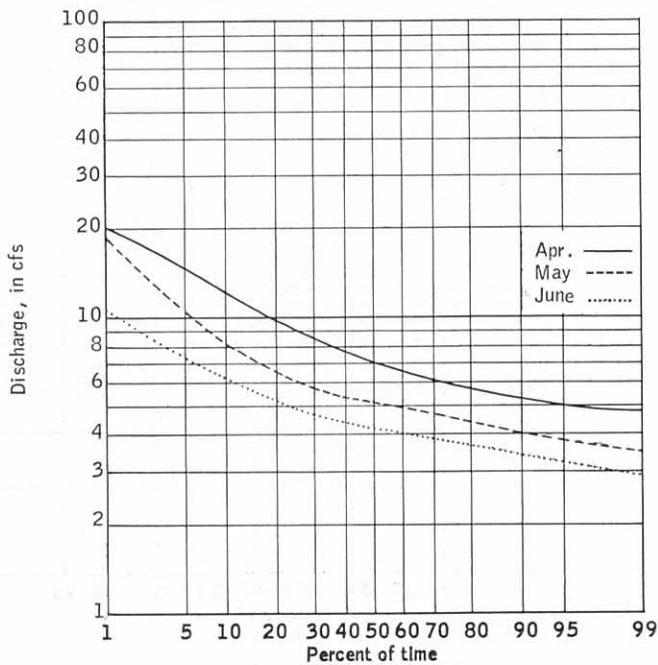


Figure 70c. FLOW-DURATION CURVES FOR APRIL, MAY, JUNE 1948-60.

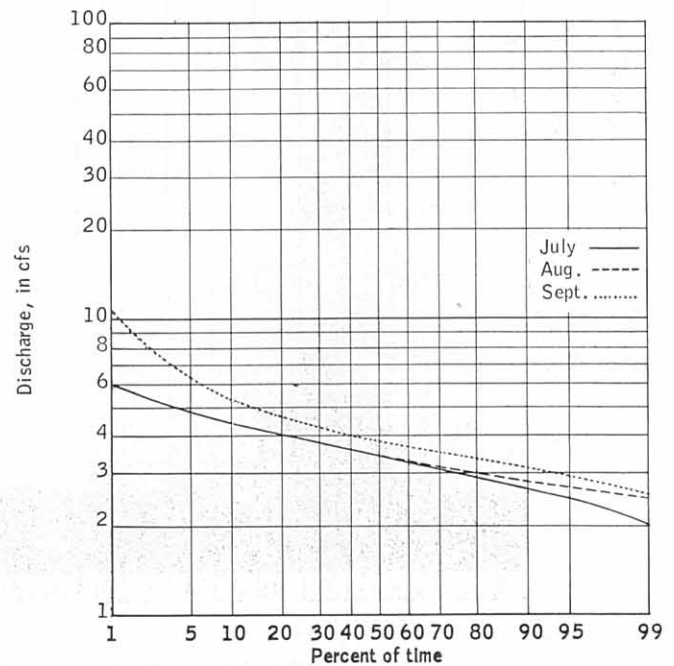


Figure 70d. FLOW-DURATION CURVES FOR JULY, AUGUST, SEPTEMBER 1948-60.

## HUGE CREEK NEAR WAUNA

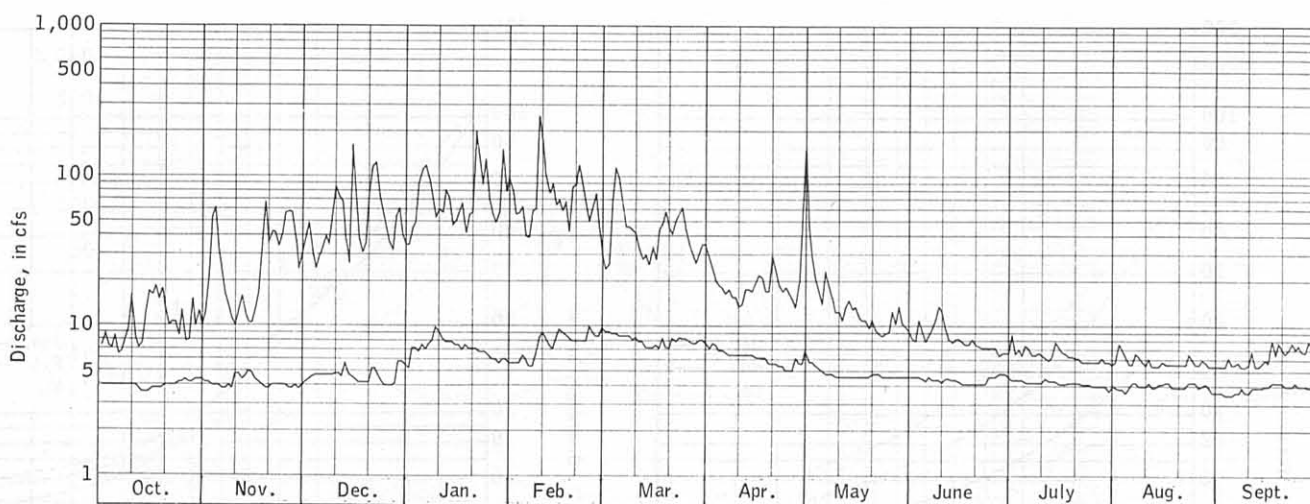


Figure 71. MAXIMUM-MINIMUM DISCHARGE HYDROGRAPHS FOR YEARS 1947-60.

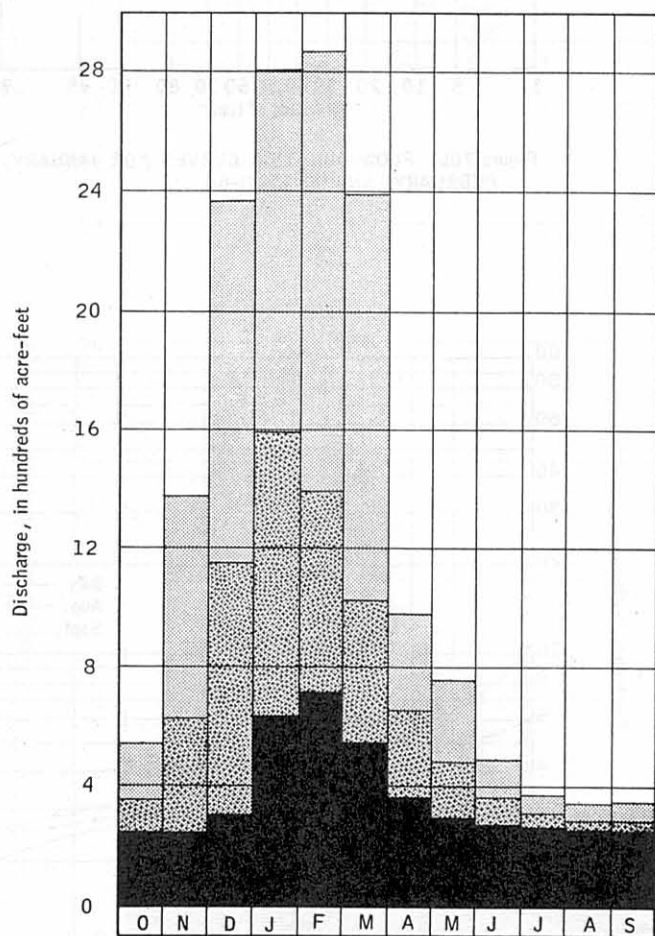


Figure 72. MAXIMUM, MINIMUM AND AVERAGE MONTHLY DISCHARGE FOR THE PERIOD 1947-60.

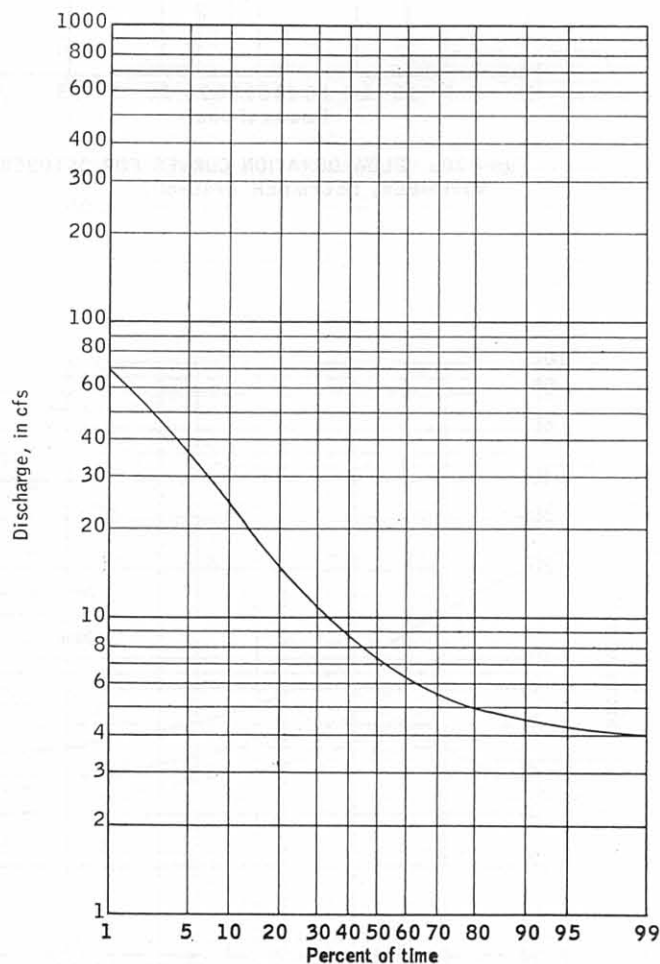


Figure 73. FLOW-DURATION CURVE FOR THE PERIOD 1948-60.

## HUGE CREEK NEAR WAUNA

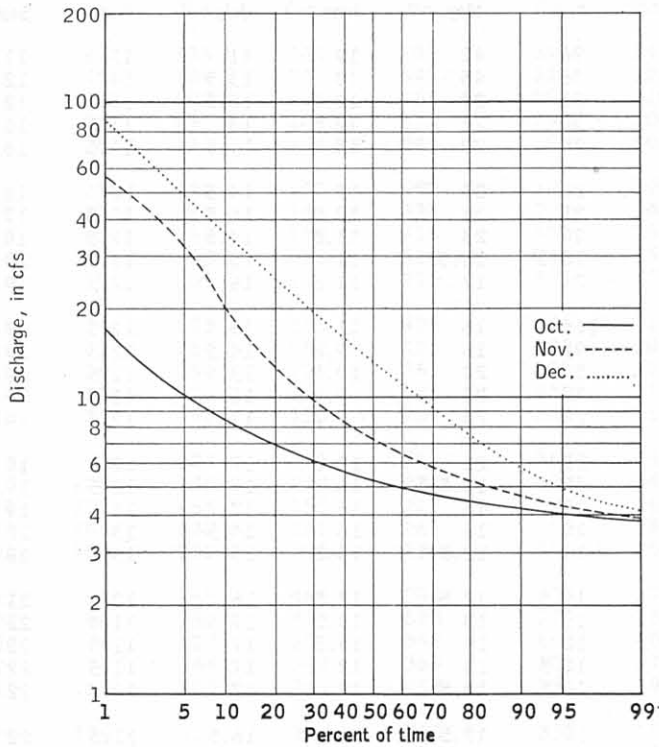


Figure 74a. FLOW-DURATION CURVES FOR OCTOBER, NOVEMBER, DECEMBER 1948-60.

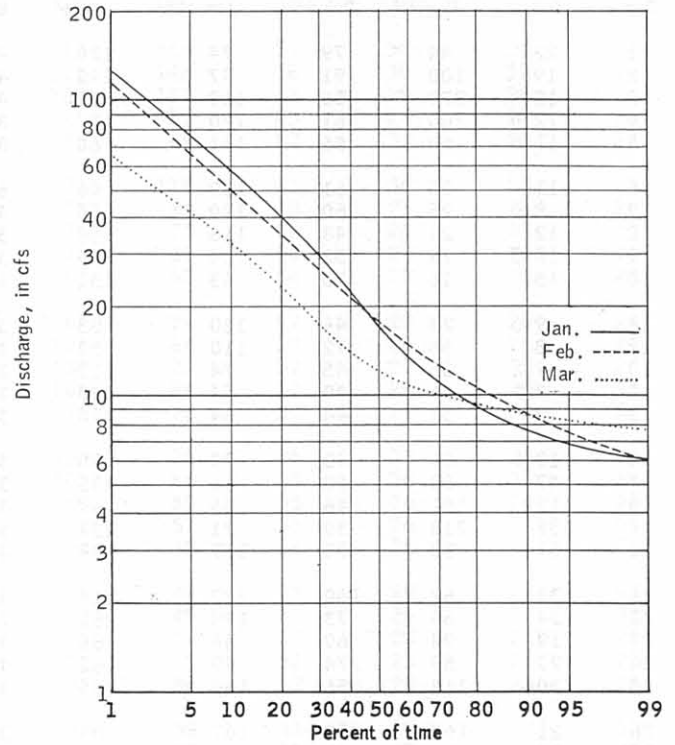


Figure 74b. FLOW-DURATION CURVES FOR JANUARY, FEBRUARY, MARCH 1948-60.

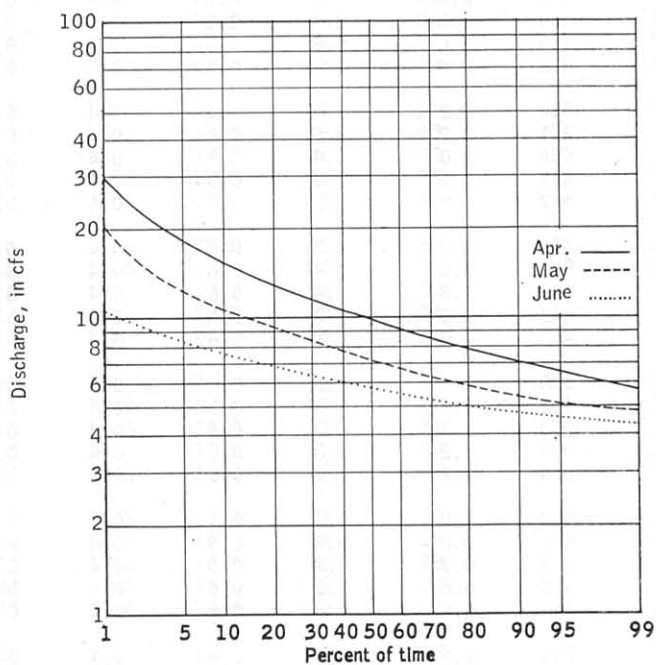


Figure 74c. FLOW-DURATION CURVES FOR APRIL, MAY, JUNE 1948-60.

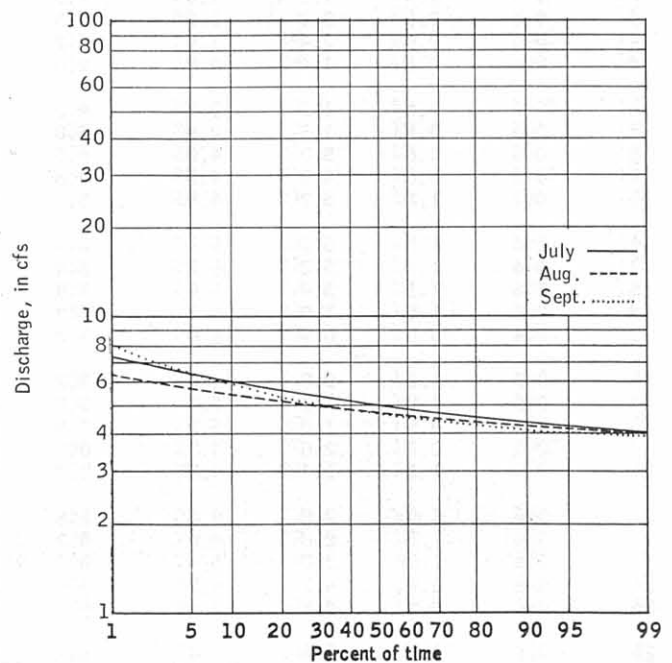


Figure 74d. FLOW-DURATION CURVES FOR JULY, AUGUST, SEPTEMBER 1948-60.